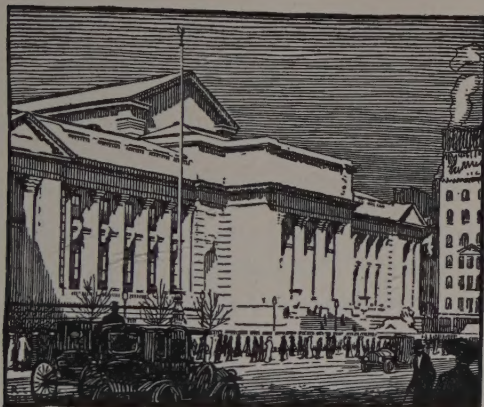


BULLETIN

OF THE

NEW YORK PUBLIC LIBRARY

ASTOR, LENOX AND TILDEN FOUNDATIONS



JUNE 1927

VOLUME 31 - - - NUMBER 6

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1927

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VOLUME 31

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POSTAL SERVICE IN BRITISH NORTH AMERICA IN 1774

A FRAGMENT OF LOST MINUTES OF THE BOARD OF DEPUTY POSTMASTERS GENERAL

Among the recent additions to the Manuscript Division of the Library is a fragment of minutes of a meeting of a Board of Deputy Postmasters General. The text printed below is without importance as an addition to the all too fragmentary information we have about postal service in the British colonies on this continent before 1776.

IN 1763, when Canada was by the Treaty of Paris conceded to be a British possession, Benjamin Franklin went to Quebec to arrange a postal service between Quebec, Three Rivers, and Montreal, and between those places and New York. At Quebec he met Hugh Finlay, a young Scotchman and justice of the peace, who had come to the country since the English conquest. To him Franklin entrusted the charge of the three post offices above named, and after this postmastership a monthly courier service was established between Montreal and New York.¹

Finlay was made, in 1765, a member of the governor's council at Quebec, and for thirty-six years thereafter, until he died, was engaged in important offices in the Canadian colony.² He was since 1763, as we have seen, also the first postmaster of the English province of Canada. As Franklin was living in England since 1764, the management of the American post office depended heavily upon his associate, John Foxcroft; which, with the growing necessity, created a demand for relief. It was determined, thereupon, to create a new office—a surveyor of the postal service, which took place in 1772, and

¹Smith, William. *History of the Post Office in British North America* (Cambridge, Eng., 1920), p. 42.
²Smith, *op. cit.*, p. 42.

Finlay was the appointee.³ In 1773 and 1774 Finlay, while holding the postmastership of Canada, undertook the difficult task of exploring uninhabited regions for opening up new postal routes, and inspecting the established lines of postal communication with the object of improving the service.⁴ His report or journal of this tour,⁵ not published until about a century later, shows how well the inspections were accomplished in that age of slow and impeded travel. This journal ended in June, 1774. During his tour he met, naturally, the various deputy postmasters and some of the postriders. Benjamin Franklin was dismissed from the major office in the postmastership on January 31, 1774, and on February 25th Finlay was named in his stead as "Deputy Postmaster General in North America." His associate and superior was John Foxcroft, "Resident Deputy Postmaster General," from whom he received his orders.⁶

V. H. P.

At a Bóard, Thursday 24th Nov^r 1774.

Present

John Foxcroft }
 Hugh Finlay } Esquires.

The Secretary laid before the Board a Letter from M^r John Kilby of New Haven, giving his Reasons for returning the Commission made out for M^r Lyman Hitchcock, and recommending M^r Elias Beers for Deputy at New Haven. Ordered, that the Secretary write⁷ to M^r Kilby, to know what way of life M^r Beers is in, and the Names of those who are to be his Securities.

Also a letter from Ebenezer Mackie Esq^r Deputy of Baltimore, in answer to the Secretary's circular Letter of the 10th Instant, desiring to know if it is necessary that he should send the Printer's Acc^{ts} & Rec^{ts} for advertising Letters. Ordered, that the Secretary write⁷ to him, to send those Accounts & Rec^{ts} by the first post.

The Secretary having rec^d a paper directed to him, entitled, "an Account of Wages paid by Thomas Foxcroft Esq^r⁸ Deputy Post Master of Philadelphia to the several Post Riders from the 5th of April 1772, to the 5th of Nov^r 1774," which paper not being signed by any Person, Ordered, that the Secre-

³ *Ibid.*, p. 46. Finlay was appointed Surveyor of Post Offices and Post Roads on the Continent of North America, in December, 1772, but did not sail from England before March, 1773.

⁴ *Ibid.*, p. 47.

⁵ *Journal of Hugh Finlay* (Brooklyn, 1867).

⁶ Both Foxcroft and Finlay are mentioned in Sabine's *American Loyalists*.

⁷ Secretary's side note showing compliance with this order, dated "Nov^r 27. R. N. C."

⁸ Brother of John Foxcroft.

return⁷ it to Tho^s Foxcroft Esq^r, and direct him immediately to send a Copy of all monies paid to Post Riders from the 5th of April 1772, to the 5th of April 1774, properly summed up, and sworn to, and that he mention his Attestation that the Receipts were taken in his Book, with other Receipts, therefore could not send them to this Office. That M^r Thomas Foxcroft be also directed to send to this office immediately, Vouchers for all monies paid by him on Office Account, without which no charge of that nature shall be allowed of in his Accounts.

Ordered, that Commissions be made out for the following Gentⁿ, viz^t Douglas Hamilton Esquire, for Suffolk, in Virginia.⁹

Alexander Henderson Esquire, for Colchester, in Virginia.

Thomas Kerr Esquire, of Hobs Hole, in Virginia.

That the Secretary write⁷ to George Lorimer Esquire, desiring him to return his Bond and Oath of Office; with M^r Gregory's Acc^t and the Ballance, ... 4 ... 4½.

A letter to be wrote⁷ to Anthony Stewart Esquire, to know if he now gets his papers regularly; and if not, if he can point out whether the fault is in the Office, the Printer's, or the Rider's, and it shall be immediately redressed. That Bags be immediately made, with brass labels affixed to them, for every Office in the Northern Department — and that the Secretary provide a proper Seal for his Office.

That the Secretary make out a list of the Deputies Bonds in the Comptrollers possession, noting their Dates, and the Sums for which they were given. Also a correct list of all Balances due from Deputies, where there can be the least doubt of their being punctually paid, on demand.

On surmises contained in late letters from Canada, fearing that there may be detentions between Skenesborough and Albany; and likewise knowing that it is impossible for one Rider to perform the Stage between this place and Albany, and return here again within the week, without several breaks during Winter, and foreseeing that this would cause much clamour in Canada, and be productive of hurt to the Revenue, & cause many reflections on the Office, which at this time the Deputy Post Masters General think they ought by every means to avoid. They have taken it most seriously into their consideration, and after reading over the Complaints transmitted last Spring by M^r Foxcroft, in a Letter from the Merchants of Montreal dated the 30th of March, and in Letters from the L^t Governor of the Province of Quebec, dated the 4th & 6th of April, they conclude that the only way to redress the grievances in these letters contained, is, First, to have two Riders between New York and Albany, One to ride on the East side of Hudson's River, to return from [here the manuscript ends abruptly].

⁹ See note on preceding page.

Suffolk, Va., was "the most Southerly Town in the Northern District." Concerning the poor conditions of postal service there, in May, 1774, see *Journal of Hugh Finlay*, p. 89-90.

NEWS OF THE MONTH

GIFTS

DURING the month of May, 1927, there were received as gifts 6,386 volumes, 14,321 pamphlets, 15 maps, and 20 prints. Some interesting items were the following:

From the Associated Advertising Clubs of the World came 985 volumes, and 37 pamphlets, mainly works on business efficiency, vocational guidance, and economics generally. From Son Altesse le Prince Youssouf Kamal, Cairo, Egypt, came a copy (one of 100 copies printed for private circulation) of his work "*Monumenta Cartographica Africae et Aegypti . . .*" Tome Premier (Époque avant Ptolémée), 1926. Mr. George Simpson Eddy gave the Library 119 volumes and 7 pamphlets, being French works relating to the Great War, 1914-1918.

From the Rev. Dr. Simon Cohen came two manuscripts — Augustus Van Cortlandt's Account of Clerk's Fees in the Mayor's Court of New York, 1760-1764; and Minutes of the Mayor's Court of New York, October 10, 1790. From the British Museum came 8 volumes and 3 portfolios, including the "Handbook to the Ethnographical Collections," 2nd edition, 1925; "Catalogue of the Engraved Gems and Cameos . . .," by H. B. Walters, 1926; "Schools of Illumination," part 5, 1926. From the Directors of the Roerich Museum, New York City, came a copy (no. 425 of 500 copies printed) of "Roerich. Himalaya. A Monograph." Articles by Frances R. Grant, Mary Siegrist, George Grebenstchikoff, Ivan Narodny, and "Banners of the East," by Nicholas Roerich, New York [c. 1926].

Mr. Carl J. Ulmann gave the Library "*Les Images de tous les Saints et Saintes de l'Année, suivant le Martyrologe Romain, Faictes Par Jacques Callot, Et mises en lumiere par Israel Henriet; Dediées a Monseigneur l'Eminentissime Cardinal Duc de Richelieu*"; A Paris Chez Israel Henriet, 1636 [2nd state of the plates]. From His Eminence, Patrick Cardinal Hayes came a copy of "Probation and Delinquency, the Study and Treatment of the Individual Delinquent," by Edwin J. Cooley, New York, 1927; and two copies each of "Pastoral Letter of the Catholic Episcopate of the United States on the Religious Situation in Mexico" and "Church and State in Mexico, Professional opinion of William D. Guthrie . . . of the American Bar, Nov., 1926."

Mr. Alfred F. Lichtenstein gave a copy (no. 25) of the privately printed work, "Red Gables on the Shrewsbury, Middletown Township, Riverside

ive, New Jersey," etched views by Bernhardt Wall [c. 1926]. From Mr. Clarence M. Cornell came an autographed copy (no. 779) of "The Romance of Greeting Cards, an Historical Account of the Origin, Evolution and Development of the Christmas Card . . . by Ernest Dudley Chase," Cambridge, 1926. From Mr. Robert H. Symonds, Warehouse Point, Conn., came a copy of his work, "Ecclesiastical Shields for the Interior of Churches," Milwaukee [c. 1926]. From Mr. Henry Andrews Ingraham came an autographed copy (no. 122 of 150 printed on Fabriano hand made paper) of a privately printed work, "American Trout Streams, a Discussion of the Problems Confronting Anglers in the Preservation . . . of American Trout Waters," printed for the Angler's Club of New York, 1926.

From Mr. Henry Ford, Dearborn, Michigan, came copies (reprinted by him in 1925) of McGuffey's New First-Fourth Eclectic Reader . . . by Wm. McGuffey, c. 1885, 3 volumes and 1 pamphlet. From Mr. Jacob Hugo Hentsch, Cedar Rapids, Iowa, came a copy of "History of Crescent Lodge, No. 25 . . ." by Jos. E. Morcombe, Cedar Rapids, 1908; and of the privately printed pamphlet, "The Mason as a citizen, an Address delivered . . . Oct. 18, 1926, by Bro. Thomas Edward Green." Mr. J. Clarence Webster, Ottawa, Canada, gave a copy of his privately printed work, "Wolfiana, a Potpourri of Facts and Fantasies culled from Literature relating to the Life of James Wolfe, arranged by John Clarence Webster in this Year of Grace the Bicenntenary Anniversary of Wolfe's Birth, 1927."

Mrs. Mary M. Hulett gave a collection of music (4 volumes and 21 pamphlets). From Herr Fritz Heinrich Klein, Linz a. D., Austria, came a copy of his work, "Zum 100. Todestag Beethovens. Drei Metamorphosen von Beethovensthemen für Klavier zu 2 Händen . . . (Faksimileausgabe)."

The following gifts of prints were received: From Mr. Gordon Grant, a set of his etchings ("Boarding the Fore Tack," "U. S. Frigate *Constitution*," "Furling the Foresail"). From Mr. Philip Little, Salem, Mass., 15 of his etchings and lithographs. From Mr. Carl Schmidt, two of his lithographs ("A Prize Fight," and "A Home on the Mississippi").

Interesting collections of material were received from the following: From Mr. Robert A. Chandler (23 volumes and 32 pamphlets in Esperanto); From Samuel S. Dale, Boston (46 pamphlets relating to wool, the metric system, etc.); Mrs. Liliane de Beauvilliers (38 volumes and 13 pamphlets); Bureau of Jewish Social Research (21 volumes and 24 pamphlets on Jewish subjects); John T. Floan (33 volumes, and 11 pamphlets on economic subjects); Mrs. A. Gerber (17 volumes and 1 pamphlet, mainly textbooks); John P. Gorham, Bridgeport, Conn. (74 volumes of annual reports of

the Chief Engineer of the War Department, 1873-1910); Mr. George J. Gruenberg (20 volumes of the Laws of New York); Knights of Columbus, Charles Carroll General Assembly, Fourth Degree, New York (97 copies of "American Catholics in the War, National Catholic War Council, 1917-1921," by Michael Williams, New York, 1921); Mrs. M. Kuyper, Arlington, Va. (207 volumes, 114 pamphlets, and 16 periodicals, being Dutch fiction, poetry, history, philosophy, etc.); Marx-Engels-Institut, Moscow (18 volumes and 122 pamphlets in the Finno-Ugrian, Turkish-Tatar, Japhetic and other tongues); Mr. H. Mindlin (43 volumes and 17 pamphlets); Miss Helen Mylan (13 volumes and 2 pamphlets, in the Finnish language); Mr. Myer Nussbaum (210 volumes, including Laws of the State of New York, Albany Law Journals, Bar Association Reports, etc.); Mr. Frederick Richardson (stereopticon views of the Grand Cañon, mounted and unmounted photographs of Coxey's Army, in all, 68 photographs); Miss Augusta Steiger (85 volumes, 18 pamphlets, and 20 periodicals, in German, English and Spanish); and Mr. Webb (365 volumes).

ADDITIONS AND USE OF THE LIBRARY IN MAY, 1927

DURING the month of May, 1927, there were received at the Library, 26,031 volumes and 15,734 pamphlets. (These include the additions to both Reference and Circulation Departments.) The total number of readers recorded in the Central Building was 154,395. Visitors to the building numbered about 307,000.

DEATH OF MR. WHITNEY

MR. PAYNE WHITNEY, Chairman of the Executive Committee of the Board of Trustees, and a member of the Board since 1915, died suddenly at his summer home in Manhasset, L. I., on Wednesday, May 25th. Mr. Whitney's death is a severe loss to the Library, to which he had given many years of valuable service on the Board of Trustees, and magnificent financial aid at times of urgent need.

NEW PERIODICALS

- American business magazine.** New York. Monthly.
- Antioquia (state), Colombia.** *Anales de la Asamblea.* Medellin, Antioquia, Colombia. Daily.
- Antiquity.** Nursling, Southampton, England. Quarterly.
- Arbeit und Verkehr.** Berlin. Monthly.
Published by the Gesamtverband deutscher Verkehrs- und Staatsbediensteter.
- Bercher.** New York. Irregular.
Published by the Society of Friends of Roerich Museum.
- Bygghäusens Arkitektur.** Maanedshæfte. Kjøbenhavn, Denmark. Monthly.
Published by the Akademisk Arkitektforening.
- Die Arbeiterbewegung.** Vienna. Monthly.
Organ of the Internationale proletarischer Frei-denker.
- Flight notes.** New York. Semi-monthly.
Published by the Daniel Guggenheim Fund for the Promotion of Aeronautics, Inc.
- Front of America.** Review. New York. Monthly.
- Il mondo nella silice.** Napoli, Italy. Monthly.
- Kampfbewerbe.** Karlsruhe, Germany. Monthly.
- Krasnaya dzyarzhavna akademiya sel'skaye khozaystva.** Zapiski. Gorki, White Russia. Irregular.
- Book-of-the-Month Club news.** New York. Monthly.
Published by the Book-of-the-Month Club, Inc.
- Books abroad.** Norman, Oklahoma. Quarterly.
Published by the State University of Oklahoma.
- Bookshelf.** Milwaukee, Wis. Irregular.
Published by the Morehouse Publishing Co.
- Call of the square.** Los Angeles, Cal. Monthly.
Published by the Echo Park Evangelistic Association, Inc.
- Chamber of Commerce for Italy.** Bulletin. Milan, Italy. Bi-monthly.
- Buerbeamte.** Hamburg, Germany. Semi-monthly.
Published by the Gewerkschaft der öffentlichen Verwaltungs- und Justizbeamten und Angestellten.
- Chinese Christian monitor.** New York. Monthly.
Published by the First Chinese Presbyterian Church.
- City Housing Corporation.** [Circular.] New York. Irregular.
- Colombia.** -- Ministerio de Guerra. *Revista militar del ejército.* Bogotá, Colombia. Monthly.
- Constructeur de ciment armé.** Paris. Monthly.
Published by the Chambre syndicale des constructeurs en ciment.
- Deutsche Oekonomist.** Berlin. Weekly.
- Dorema America.** Buenos Aires, Argentina. Monthly.
- Earth.** Topeka, Kansas. Monthly.
Published by the Atchison, Topeka and Santa Fe Railway System.
- Échos d'Orient.** Paris. Quarterly.
- Esperanto-junularo.** Leipzig, Germany. Eight numbers a year.
- Etnografiya.** Moscow, S.S.S.R. Semi-annual.
- Flambeau du nord.** Tourcoing, France. Monthly.
- Flandre littéraire.** Brussels, Belgium. Irregular.
- Greater Washington.** Washington, D. C. Monthly.
Published by the Washington Chamber of Commerce.
- Guidon.** New York. Monthly.
Published by the Women's National Republican Club, Inc.
- Hamburg.** Germany. -- Senatskommission für die Justizverwaltung. *Hamburgisches Justizverwaltungsblatt.* Hamburg, Germany. Irregular.
- Harrap mercury.** London. Irregular.
Published by George G. Harrap & Co., Ltd.
- Idysher kurier.** Bialystok, Poland. Daily.
- Importers guide.** New York. Monthly.
- Imprensa israelita-brasileira.** Rio de Janeiro, Brazil. Semi-weekly.
- Institut Lenina.** Leninski sbornik. Moscow, S.S.S.R. Semi-annual.

- Iron and steel industry and British foundryman.** London. Monthly.
Supplement to the *Metal industry*.
- Italy.** — Ministero dell' Aeronautica. Rivista aeronautica. Roma, Italy. Monthly.
- Der Kampf.** Toronto, Ont. Weekly.
- Kokumin-Keizai Zasshi.** Kobe, Japan. Monthly.
Published by the Kobe Higher Commercial School.
- Land und Freiheit.** Hamburg-Fuhlsbüttel, Germany. Monthly.
- La Plata.** — Universidad nacional: Facultad de Agronomía. Revista. La Plata, Argentina. Irregular.
- Latvijas Banka.** Economic review. Riga, Latvia. Three times yearly.
- Lavender.** New York City. Irregular.
- Leader.** Dublin, Irish Free State. Weekly.
- League to Abolish Capital Punishment.** Bulletin. New York City. Monthly.
- Lettres.** Paris. Monthly.
- Libertador cubano.** Habana, Cuba. Weekly.
- Licht Bild Bühne.** Berlin. Daily.
- F. O. Licht's** Monthly report. Magdeburg, Germany. Monthly.
- Minneapolis Public Library.** Staff stuff. Minneapolis, Minn. Irregular.
- Mirovoye khozyaistvo i mirovaya politika.** Moscow, S.S.S.R. Monthly.
Published by Kommunisticheskaya Akademiya. — Institut Mirovovo khozyaistva i mirovoi politiki.
- Naša Mládež.** Newark, N. J. Irregular.
- National Council of Catholic Men.** — Lay Organization Department. Information bulletin. Washington, D. C. Irregular.
- Nauchnoye obshchestvo po izucheniyu byta, istorii i kultury Bashkir.** Trudy. Ufa, S.S.S.R. Irregular.
- Near East.** New York. Irregular.
Published by the Near East College Association.
- Nebraska.** — Vocational Education State Board. Vocational education. Lincoln, Neb. Bi-monthly.
- New York pharmacist.** New York. Monthly.
Published by the New York Pharmaceutical Conference, Inc.
- New York Trust Company.** [Condensed statement.] New York. Semi-annual.
- Ninth district banker.** Minneapolis, Minn. Semi-monthly.
- Novi Sviyet.** Chicago, Ill. Weekly.
Organ of the Yugoslav Educational Federation.
- Obshchestvo obsledovaniya i izucheniya Azerbaidzhana.** Izvestiya. Baku, Azerbaidzhan. Irregular.
- Trudy. Baku, Azerbaidzhan. Irregular.
- Oklahoma.** — Crop Reporting Service. Oklahoma crop summary. Oklahoma City, Oklahoma. Quarterly.
- Oriental magazine.** New York. Bi-monthly.
- Orientalia.** Roma, Italy. Irregular.
Published by the Pontificio istituto biblico.
- Pervisne gromadyanstvo.** Kiev, S.S.S.R. Irregular.
Published by the Vseukrains'ka Akademiya Nauk. — Kul'turno-Istorigchna Komisiya.
- Poland.** — Ministerstwo spraw zagranicznych. Dzienik urzędowy. Warszawa, Poland. Monthly.
- Pravoslavnaya rossiiskaya tserkov'.** — Svyashchennyi sinod. Vestnik. Moscow, S.S.S.R. Monthly.
- Princeton University.** — Economics and Social Institutions Department: Industrial Relations Section. [Statement of labor banks.] Princeton, N. J. Quarterly.
- Pro-México.** New York. Semi-monthly.
Published by the Sociedad mutualista mexicana.
- Public welfare.** Richmond, Va. Monthly.
Published by the Virginia State Board of Public Welfare.
- Quincy, Ill.** — Public Library. Bulletin. Quincy, Ill. Bi-monthly.
- Radio blue book.** New York. Semi-annual.
- Radio record.** Minneapolis, Minn. Monthly.
- Research group news.** Chicago, Ill. Quarterly.
Published by the Electric Steel Founders' Research Group.
- Review in advance.** New York. Monthly.
Published by the First Edition Society.
- Revista nacional.** Ciudad Juarez, Chihuahua. Monthly.
Published by the Cruz azul mexicana.
- Rivista internazionale di filosofia del diritto.** Roma. Quarterly.
- S.S.S.R.** — Tzentralfnoye Statisticheskoye Upravleniye: Otdel statistiki, transporta i svyazi. Kon'yunkturnaya tovaro-transportnaya statistika. Moscow, S.S.S.R. Monthly.

- S. S. R.** — Vysshii sovet narodnovo khoz-
raistva: Glavnyi khlopkovyĭ komitet.
Biblioteka khlopkovovo dela. Moscow,
S.S.S.R. Irregular.
- n sebe agronom.** Moscow, S.S.S.R.
Weekly.
- ornik matice slovenskej.** Turčiansky Sv.
Martine, Czechoslovakia. Semi-annual.
Published by Matica Slovenská.
- ul un lerer.** New York. Quarterly.
- venské Pohľady.** Turčiansky Sv. Mar-
tine, Czechoslovakia. Monthly.
- cial service review.** Chicago, Ill.
Quarterly.
Edited by the Chicago University Social Service
Administration Graduate School.
- andard.** Sydney, N. S. W. Monthly.
- tesman.** St. Louis, Mo. Monthly.
Published by the National Currency and Employ-
ment League.
- ourban home guide.** New York.
Monthly.
- mple tidings.** Newark, N. J. Weekly.
Published by Temple B'nai Jeshurun.
- warzystwo naukowe w Toruniu.** Zapiski.
Toruń, Poland. Quarterly.
- ade survey.** London. Quarterly.
Published by the British Electrical and Allied Manu-
facturers' Association.
- avel talks.** New York. Monthly.
Published by the Bowery Savings Bank.
- Tripod of Phi Beta Delta.** New York.
Three times yearly.
Published by the Phi Beta Delta Fraternity.
- Union labor bulletin.** Little Rock, Ark.
Weekly.
Published by the Arkansas State Federation of
Labor and Central Trades and Labor Council.
- United States.** — Census Bureau. Survey
of current business. Weekly supplement.
Washington, D. C. Weekly.
- Věstník československy.** Buenos Aires, Ar-
gentina. Semi-monthly.
- Vierteljahrshefte zur Konjunkturforschung.**
Ergänzungsheft. Berlin, Germany. Quar-
terly.
- Vigilant.** New York. Monthly.
- Voorslag.** Durban, South Africa. Monthly.
- Vysoká škola zemědělská.** — Fakulta hos-
podarská. Sborník. Brno, Czechoslovakia.
Semi-annual.
- Western progressive farmer.** Prosser,
Washington. Monthly.
Published by the Western Progressive Farmers of
the State of Washington.
- White Russia.** — Instytut belaruskaye kul'-
tury. Addzel 2, Ser. 1. Mensk, White
Russia. Irregular.
- Zahraníční politika.** Prague, Czechoslo-
vakia. Monthly.
- Zeitschrift für das gesamte Mühlenwesen.**
Frankfurt a. M., Germany. Monthly.

STARCHES

1811-1925

A LIST OF REFERENCES DEALING WITH THE CHEMISTRY AND TECHNOLOGY OF STARCHES, DEXTRINS AND AMYLASES

COMPILED BY

ROBERT P. WALTON, Science and Technology Division

ORDER OF ARRANGEMENT

STARCHES AND DEXTRINS

CHEMICAL SECTION

- Acid Hydrolysis
- Enzymic Hydrolysis
- Molecular Constitution
- Components of Starch Granule
- Crystalline Dextrins formed by Bacterial Degradation of Starch
- General Chemical Characteristics
 - Reactions with Iodine
 - Reactions with Formaldehyde
 - Reactions with Bases
 - Reactions with Oxidizing Agents
- Ethers and Esters
- Hydrolysis by Salts
- Soluble and Modified Starches
- Preservation of Starch Solutions

PHYSICAL SECTION

- General Physical Characteristics
 - Viscosity and Plasticity
 - Gelatinization
 - Coagulation and Retrogradation
- Microscopic Observations

ANALYTICAL SECTION

- Methods of Determination
 - Polarimetric Methods
 - Saccharimetric Methods

ANALYTICAL SECTION, *continued*.

- Gravimetric Methods
- Iodine Methods
- Specific Gravity Methods
- Comparison of Methods
- Detection, Differentiation and Identification
- Determinations in Various Materials
- Analytical Examination

TECHNOLOGICAL SECTION

- Industrial Sources
- Manufacture of Starch
- Manufacture and Preparation of Dextrin
- Starch Factory Waste Waters
- Industrial Applications of Starch and Dextrin

AMYLASES

- Purification
- General Characteristics
- Activation and Inactivation by Salts, Acids, etc.
- Optimum and Inactivating Temperatures
- Action of Sunlight, Ultra-Violet Rays and Roentgen Rays
- Adsorption of Amylases
- Determination of Activity
 - Determination of Amyloclastic Activity
 - Determination of Saccharogenic Activity
- Mould, Fungus, Yeast and Bacterial Amylases
- Sources and Occurrence
- Industrial Applications

PART V

STARCHES AND DEXTRINS, *continued*

COAGULATION AND RETROGRADATION

1354. Scharling. Einige Versuche über Amylum. (Annalen der Chemie und Pharmacie, Liebig's, Heidelberg, 1844, Bd. 49, p. 315-316.) **PKA**

Finds that when a starch suspension is frozen there is a well defined separation into an insoluble spongy material and a clear solution. The properties of these substances are further investigated.

1355. Ljubavin, N. N. Über das Gefrieren einiger kolloidaler Lösungen. (Auszug.) (Chemisches Central-Blatt, Hamburg and Leipzig, 1890, p. 515.) **PKA**

When a starch paste is frozen, the starch

is coagulated but is only incompletely precipitated.

1356. Roux, Eugène. Sur l'état de l'amidon dans le pain rassis. (Académie des sciences, Comptes rendus, Paris, 1894, tome 138, p. 1356-1358.) ***EO**

Although wheat starch, like potato starch, is partially converted into amylocellulose on standing for some days at 10°, the formation of amylocellulose in bread after standing could not be detected. The amylocellulose was estimated by carrying out comparative saccharifications on the sample

arches and Dextrins, continued.

agulation and Retrogradation, continued.

before and after heating in a sealed tube 150°.

Abstract in *Jour. chem. soc.*, 1904, v. 86, part 2, 625; *Chem. Centr.*, 1904, Bd. 2, p. 255; *Jour. soc. chem. ind.*, 1904, v. 23, p. 675.

57. Maquenne, Léon. Sur la rétrogradation de l'empois d'amidon. (Académie des sciences, Comptes rendus, Paris, 1903, tome 7, p. 88-90.) *EO

The deposit which settles from a homogeneous starch jelly is not colored by iodine, is not attacked by malt, is only slowly attacked by dilute mineral acids, but is easily soluble in dilute KOH. Suggests a stonic structure for the amylocellulose. Studies velocity of the transformation to amylocellulose.

Abstract in *Jour. chem. soc.*, 1903, v. 84, part 1, 679; *Chem. Centr.*, 1903, Bd. 2, p. 557.

58. Wolff, Jules, and AUGUSTE FERNCH. Sur la coagulation de l'amidon. (Académie des sciences, Comptes rendus, Paris, 1903, tome 137, p. 718-719.) *EO

Solutions containing more than 4% starch are precipitated by malt extract, due to the essence of the enzyme "amylocoagulase." In more dilute solutions this coagulation is prevented by action of the diastase.

Printed in further detail in *Institut Pasteur, Ann.*, Paris, 1904, tome 18, p. 165-180, QDA.

Abstract in *Jour. soc. chem. ind.*, 1903, v. 22, p. 12; *Jour. chem. soc.*, 1904, v. 86, part 1, p. 211; *Chem. Centr.*, 1903, Bd. 2, p. 1451; *Bull. soc. chim. Paris*, 1904, série 3, tome 31, p. 766-767.

59. Maquenne, Léon. Sur la rétrogradation de l'empois d'amidon. (Académie des sciences, Comptes rendus, Paris, 1903, tome 7, p. 797-799.) *EO

The transformation of starch paste into amylocellulose is favored by the presence of mineral acids and by a lowering of temperature. Effects similar to that of amylocoagulase may be obtained by purely physical or chemical methods.

Reprinted in further detail in *Bull. soc. chim. Paris*, 1903, série 3, tome 29, p. 1218-1225.

Abstract in *Jour. chem. soc.*, 1904, v. 86, part 1, 7; *Chem. Centr.*, 1904, Bd. 1, p. 16.

60. Boidin, A. Contribution à l'étude de l'amylo-coagulase. (Académie des sciences, Comptes rendus, Paris, 1903, tome 137, p. 10-1082.) *EO

Coagulation is effected by the diastases Mucor β , which are used for the industrial fermentation of amylaceous materials. Amylocoagulase partially precipitates amylose with starch, the precipitated amylose retaining some of its activity. The activity of the solution diminishes rapidly in

consequence of the precipitation of the amylose.

Abstract in *Jour. soc. chem. ind.*, 1904, v. 23, p. 31; *Chem. Centr.*, 1904, Bd. 1, p. 196.

1361. Maquenne, Léon. Sur la rétrogradation de l'empois d'amidon. (Académie des sciences, Comptes rendus, Paris, 1903, tome 137, p. 1266-1268.) *EO

Studies effect of alkalis on the reversion of starch paste. Believes that in absence of foreign material, starch paste would remain unchanged.

Abstract in *Jour. chem. soc.*, 1904, v. 86, part 1, p. 227; *Chem. Centr.*, 1904, Bd. 1, p. 466.

1362. Fernbach, Auguste, and JULES WOLFF. Nouvelles observations sur la formation diastatique de l'amylocellulose. (Académie des sciences, Comptes rendus, Paris, 1904, tome 138, p. 819-821.) *EO

The formation of amylocellulose in starch solutions is greatly increased by addition of malt extract. If the action of malt extract has proceeded 15 minutes, the diastase may be destroyed, by heating to 120°, and the formation of amylocellulose will proceed at the same rate as in solutions containing unaltered diastase. Previously boiled malt extract has no effect on the formation of amylocellulose in starch solutions.

Abstract in *Jour. soc. chem. ind.*, 1904, v. 23, p. 449; *Jour. chem. soc.*, 1904, v. 86, part 1, p. 374; *Chem. Centr.*, 1904, Bd. 1, p. 1198.

1363. — Sur la coagulation diastatique de l'amidon. (Académie des sciences, Comptes rendus, Paris, 1904, tome 139, p. 1217-1219.) *EO

Starch must exist in a definite condition of liquefaction before it is subject to diastatic coagulation. If this state of liquefaction is effected by enzymes containing no coagulase or if effected by heating to 145°, the starch is then readily coagulated by infusions of raw barley, wheat or rye, which normally possess no coagulating power.

Abstract in *Jour. soc. chem. ind.*, 1905, v. 24, p. 99; *Jour. chem. soc.*, 1905, v. 88, part 1, p. 164; *Chem. Centr.*, 1905, Bd. 1, p. 356.

1364. — Studies on the coagulation of starch. (Federated Institutes of Brewing, Journal, London, 1904, v. 10, p. 216-237.)

VTRA

The action of amylo-coagulase is favored by alkali, which restrains the antagonistic enzyme diastase. A constituent of the coagulated matter is amylo-cellulose or retrograded starch, which is resistant to the action of diastase and mineral acids, and is not colored blue by iodine. The activity of the coagulase solution is destroyed at 63°, but the enzyme, when dry, is resistant to much higher temperatures.

Reprint in *Annales de l'Institut Pasteur*, 1904, tome 18, p. 165-180, QDA.

Abstract in *Jour. soc. chem. ind.*, 1904, v. 23, p. 616; *Jour. chem. soc.*, 1904, v. 86, part 1, p. 374;

*Starches and Dextrins, continued.**Coagulation and Retrogradation, continued.*

Chem. Centr., 1904, Bd. 2, p. 47; *Bull. soc. chim. Paris*, 1904, série 3, tome 31, p. 766.

1365. Lévy, Lucien. Sur la rétrogradation de l'empois d'amidon. (Association des chimistes, Bulletin, Paris, 1904-05, tome 22, p. 658-662.) **VOA**

Briefly reviews work of Lindet, Maquenne, Fernbach, Wolff and Boidin.

1366. Maquenne, Léon, and others. Rétrogression et coagulation de l'amidon. Par L. Maquenne, A. Fernbach, et J. Wolff. (Académie des sciences, Comptes rendus, Paris, 1904, tome 138, p. 49-51.) ***EO**

Amylocellulose, formed by spontaneous reversion of starch jelly, does not give a blue color with iodine and is not hydrolyzed by malt extract. The formation of amylocellulose is much more rapid in the coagulum obtained by the action of amylocoagulase on starch paste than it is in the spontaneous reversion of starch paste.

Abstract in *Jour. chem. soc.*, 1904, v. 86, part 1, p. 228; *Jour. soc. chem. ind.*, 1904, v. 23, p. 124; *Chem. news*, 1904, v. 89, p. 71; *Chem. Centr.*, 1904, Bd. 1, p. 467.

1367. Maquenne, Léon. Sur la formation et la saccharification de l'amidon rétrogradé. (Académie des sciences, Comptes rendus, Paris, 1904, tome 138, p. 213-214.) ***EO**

Starch solutions of increasing concentration were prepared and allowed to stand 4 days. The amount of amylocellulose formed increases with the concentration. The amylocellulose formed is partially affected by amylase at higher temperatures, but is never completely dissolved. Amylocellulose is probably a mixture of substances possessing its properties in varying degrees.

Abstract in *Jour. chem. soc.*, 1904, v. 86, part 1, p. 294; *Jour. soc. chem. ind.*, 1904, v. 23, p. 197; *Chem. news*, 1904, v. 89, p. 101; *Chem. Centr.*, 1904, Bd. 1, p. 682.

1368. — Sur la nature de la fécule crue. (Académie des sciences, Comptes rendus, Paris, 1904, tome 138, p. 375-377.) ***EO**

Freshly prepared starch paste is completely saccharified by amylase as well as by hydrolyzing acids, but paste which has been kept for some time contains insoluble reversion products which are saccharified only with difficulty. Upon treatment with amylase raw starch granules showed 2.8% soluble matter; raw starch ruptured by trituration, 94.8%, and starch paste, 102.2%.

Abstract in *Jour. soc. chem. ind.*, 1904, v. 23, p. 261; *Jour. chem. soc.*, 1904, v. 86, part 1, p. 294.

1369. Fernbach, Auguste, and JULES WOLFF. Analogie entre l'amidon coagulé par l'amylocoagulase et l'amidon de pois.

(Académie des sciences, Comptes rendus, Paris, 1905, tome 140, p. 1547-1549.) ***EO**

Pea starch contains 17-18% of a substance insoluble in boiling water and unsaccharified by malt at 70°; its properties are essentially those of amylocellulose.

Abstract in *Jour. soc. chem. ind.*, 1905, v. 24, p. 744; *Jour. chem. soc.*, 1905, v. 88, part 1, p. 574; *Chem. Centr.*, 1905, Bd. 1, p. 142; *Bull. assoc. chimistes*, 1905-06, tome 23, p. 179.

1370. Maquenne, Léon, and EUGÈNE ROUX. Sur la constitution, la saccharification et la rétrogradation des empois de fécule. (Académie des sciences, Comptes rendus, Paris, 1905, tome 140, p. 1303-1308.) ***EO**

Considerable evidence that ordinary starch is composed of amylocellulose and a substance termed "amylopectin," representing respectively about 80 and 20% of the starch. The amylocellulose and its soluble form, "artificial starch," have been previously described. Amylopectin is a mucilaginous substance, which gives no coloration with iodine and is not saccharified by malt extract. To it is due the residual dextrin of saccharification and the gelatinizing properties of ordinary starch. Liquefying diastases act only on amylopectin and are termed "amylopectinase."

Abstract in *Jour. soc. chem. ind.*, 1905, v. 24, p. 630; *Jour. chem. soc.*, 1905, v. 88, part 1, p. 511; *Chem. news*, 1905, v. 91, p. 279; *Chem. Centr.*, 1905, Bd. 2, p. 121.

1371. — Sur la constitution, la saccharification et la rétrogradation des empois de fécule. (Société chimique de Paris, Bulletin, 1905, série 3, tome 33, p. 723-731.) **PKA**

A more detailed account of entry 1370. Supplements by introducing the term "amylose" for "amylocellulose." Natural starch is therefore a mixture of "amylose" and "amylopectin."

Condensed in *Bull. assoc. chimistes*, 1905, tome 22, p. 1299-1301.

Abstract in *Chem. Centr.*, 1905, Bd. 2, p. 314.

1372. Roux, Eugène. Sur la transformation de l'amylocellulose en amidon. (Académie des sciences, Comptes rendus, Paris, 1905, tome 140, p. 440-442.) ***EO**

Amylocellulose, when heated with an excess of water, liquefies and goes through successive steps of degradation according to the temperature and time of heating. "Artificial starch" is formed by heating for 3 hours at 150°; its spherical granules somewhat resemble those of rice starch and it is capable of reversion to amylocellulose. The amylocellulose, upon more prolonged heating, forms amylopectin and amorphous dextrins, incapable of reversion.

Reprinted in detail in *Bull. soc. chim. Paris*, 1905, série 3, tome 33, p. 471-475.

Abstract in *Jour. soc. chem. ind.*, 1905, v. 24, p. 285; *Jour. chem. soc.*, 1905, v. 88, part 1, p. 262; *Chem. Centr.*, 1905, Bd. 1, p. 864.

Starches and Dextrins, continued.

Coagulation and Retrogradation, continued.

1373. — Sur la rétrogradation des amidons artificiels. (Académie des sciences, Comptes rendus, Paris, 1905, tome 140, p. 946.) *EO

Compares rate of reversion of solutions of 3 types of "artificial starch" with that of ordinary potato starch. The reversion was much more rapid the less soluble the type of starch; the "artificial starches" all reverted more rapidly than ordinary starch. The optimum conditions of acidity or alkalinity are represented by 1% sulphuric acid and 1.02% potassium hydroxide.

Abstract in *Jour. soc. chem. ind.*, 1905, v. 24, p. 328; *Jour. chem. soc.*, 1905, v. 88, part 1, p. 328; *Chem. Centr.*, 1905, Bd. 1, p. 1375.

1374. — Rétrogradation et saccharification des amidons artificiels. (Société chimique de Paris, Bulletin, 1905, série 3, tome 1, p. 788-795.) PKA

A more detailed account of entries 1373 and 1371.

1375. Wolff, Jules, and AUGUSTE FERNBACH. Sur la coagulation diastasique de l'amidon. (Académie des sciences, Comptes rendus, Paris, 1905, tome 140, p. 95-97.) *EO

Confirm earlier statements as to the initiative coagulating action of diastase (entry 1372). Find the condition of liquefaction, which favors coagulation, is equally favorable to the diastatic formation of amylo-cellulose.

Abstract in *Jour. soc. chem. ind.*, 1905, v. 24, p. 312; *Jour. chem. soc.*, 1905, v. 88, part 1, p. 312; *Bull. assoc. chimistes*, 1905, tome 22, p. 723.

1376. Wolff, Jules. Sur le dosage de l'amidon coagulé et de l'amylo-cellulose. (Annales de chimie analytique, Paris, 1905, tome 10, p. 389-392.) PKA

Method is based on difference of soluble products formed in three flasks containing equal amounts of starch paste; the first is charified with malt extract; the second is coagulated with a small amount of extract for three hours and boiled malt extract added; the third is coagulated as the second and then saccharified with malt extract.

Abstract in *Jour. soc. chem. ind.*, 1906, v. 25, p. 866; *Jour. chem. soc.*, 1905, v. 88, part 2, p. 866; *Chem. Centr.*, 1905, Bd. 2, p. 1557.

1377. Fernbach, Auguste, and JULES WOLFF. Anti-Diastase und Anti-Amylo-cellulase. (Auszug.) (Wochenschrift für Tiererei, Berlin, 1906, Jahrg. 23, p. 743.)

†† VTRA
Rabbits subcutaneously injected with extract of malt develop in the blood serum an anti-amylocoagulase. This is taken as an-

other proof of the presence of amylocoagulase in malt extract.

Abstract in *Jour. soc. chem. ind.*, 1907, v. 26, p. 61.

1378. Roux, Eugène. Sur la rétrogradation et la composition des amidons naturels autres que la fécule. (Académie des sciences, Comptes rendus, Paris, 1906, tome 142, p. 95-97.) *EO

Starch pastes of various origins are converted by malt extract into approximately 83% maltose. The starch pastes all reverted forming amylo-cellulose, which on hydrolysis gives 100-102% maltose. Concludes that all starches contain practically constant proportions of "amylose" and amylopectin.

Reprinted in *Bull. assoc. chimistes*, 1905-06, tome 23, p. 1041-1042.

Abstract in *Jour. soc. chem. ind.*, 1906, v. 25, p. 130; *Jour. chem. soc.*, 1906, v. 90, part 1, p. 235; *Chem. Centr.*, 1906, Bd. 1, p. 550; *Bull. assoc. chimistes*, 1905-06, tome 23, p. 949.

1379. Fouard, Eugène. Sur les propriétés colloïdales de l'amidon. (Académie des sciences, Comptes rendus, Paris, 1907, tome 144, p. 501-503.) *EO

Evidence that phosphoric acid does not exist in combination with the starch molecule but is fixed by the starch granule. Coagulation results from this fixation of acid and the addition of mineral acids accelerates such coagulation. Alkali converts previously coagulated starch into the pseudo-soluble form.

Abstract in *Jour. soc. chem. ind.*, 1907, v. 26, p. 832; *Jour. chem. soc.*, 1907, v. 92, part 1, p. 391; *Chem. abstr.*, 1907, v. 1, p. 1332; *Chem. Centr.*, 1907, Bd. 1, p. 1029.

1380. — Sur les propriétés colloïdales de l'amidon. (Académie des sciences, Comptes rendus, Paris, 1907, tome 144, p. 1366-1368.) *EO

Weak acids are without action on the coagulation of starch, while for strong acids the speed of coagulation, up to a certain limit, increases with the concentration of hydrogen ions. With the exception of baryta, alkaline solutions possessing equal concentrations of hydroxyl ions, retard the coagulation of starch to the same extent. Insoluble starch, purified from salts and free acids, is converted into the soluble form by prolonged contact with water at 60°.

Condensed in *Bull. assoc. chimistes*, 1907-08, tome 25, p. 165.

Abstract in *Jour. soc. chem. ind.*, 1907, v. 26, p. 832; *Chem. abstr.*, 1907, v. 1, p. 2313; *Jour. chem. soc.*, 1907, v. 92, part 1, p. 677; *Chem. Centr.*, 1907, Bd. 2, p. 391.

1381. — Sur les propriétés colloïdales de l'amidon et sur sa gélification spontanée. (Académie des sciences, Comptes rendus, Paris, 1908, tome 147, p. 931-933.) *EO

Follows the progress of coagulation in a neutral pseudo-solution of starch and finds

*Starches and Dextrins, continued.**Coagulation and Retrogradation, continued.*

a progressive decrease in the quantity and specific rotatory power of the dissolved substances.

Abstract in *Jour. soc. chem. ind.*, 1908, v. 27, p. 1215; *Jour. chem. soc.*, 1909, v. 96, part 1, p. 13; *Chem. Zentr.*, 1909, Bd. 1, p. 68.
Reprinted in further detail in *Bull. soc. chim. France*, 1909, série 4, tome 5, p. 63-67.

1382. Wolff, Jules. Die Stärke in der Natur und im Laboratorium. (Zeitschrift für Spiritusindustrie, Berlin, 1908, Jahrg. 31, p. 137-139.) †† **VTZA**

Discusses origin, composition, hydrolysis, liquefaction, coagulation, and decoagulation of starch.

Abstract in *Chem. Centr.*, 1908, Bd. 1, p. 1616; *Wag. Jahr.*, 1908, Jahrg. 54, Abt. 2, p. 192.

1383. Malfitano, G., and A. N. Moschkoff. Sur la coagulation de la matière amylacée par congélation. (Académie des sciences, Comptes rendus, Paris, 1910, tome 150, p. 710-711.) * **EO**

When a starch solution is frozen and then melted, the starch is obtained as a coagulum, while the liquid contains most of the mineral matter along with a small amount of starchy substance; electrolytes increase the amount of starchy matter remaining in solution.

Abstract in *Jour. soc. chem. ind.*, 1910, v. 29, p. 506; *Chem. abst.*, 1910, v. 4, p. 1556; *Jour. chem. soc.*, 1910, v. 98, part 1, p. 301; *Chem. Zentr.*, 1910, Bd. 1, p. 2074; *Jahresber. Chem.*, 1910, Teil 2, p. 408.

1384. — Sur la purification de l'amidon. (Académie des sciences, Comptes rendus, Paris, 1910, tome 151, p. 817-819.) * **EO**

After heating 1% potato starch paste in an autoclave at 130°, the cooled liquid is decanted from any residue, frozen in a nickel mould, allowed to melt, the coagulated starch dissolved in fresh water and the cycle repeated, the heating being carried out on a water bath, however. Obtain starch giving less than 0.2% ash.

Abstract in *Chem. abst.*, 1911, v. 5, p. 1345; *Jour. soc. chem. ind.*, 1910, v. 29, p. 1402; *Chem. Zentr.*, 1911, Bd. 1, p. 17; *Bull. assoc. chimistes*, 1910-11, tome 28, p. 426; *Bull. soc. chim. France*, 1911, série 4, tome 9, p. 567.

1385. Lisbonne, Marcel. Coagulation de l'amidon par la salive et le sucre pancréatique. (Société de biologie, Comptes rendus, Paris, 1911, tome 71, p. 140-142.) **QAA**

Abstract in *Bull. assoc. chimistes*, 1911-12, tome 29, p. 634; *Bull. soc. chim. France*, 1912, série 4, tome 11, p. 46.

1386. Loeb, Walther. Über die Einwirkung der stillen Entladung auf Stärke und Glykokoll. (Biochemische Zeitschrift, Berlin, 1914, Bd. 60, p. 286-296.) **PPB**

The silent discharge partially hydrolyzes dilute starch solutions and at the same time

causes a flocculent deposition of insoluble starch. Suggests that this flocculation is due to an accelerating influence of the electric discharge on the course of retrogradation.

Abstract in *Chem. Zentr.*, 1914, Bd. 1, p. 1496.

1387. Berczeller, L. Über die "Reversion der diastatischen Wirkung." (Biochemische Zeitschrift, Berlin, 1917, Bd. 84, p. 37-41.) **PPB**

The precipitate formed by action of amylase on starch has been termed by other investigators a "reversion product." The author, using experimental observations of Meyer, maintains that the phenomenon is due to an aggregation of colloidal particles. The action of amylase diminishes the viscosity and thus promotes the precipitation of the larger particles as they are formed.

Abstract in *Jour. chem. soc.*, 1918, v. 114, part 1, p. 131; *Chem. abst.*, 1918, v. 12, p. 1299; *Chem. Zentr.*, 1918, Bd. 1, p. 328.

1388. Sallinger, Hermann. Der ausschlaggebende Einfluss des Dispersitätsgrades der Stärkelösungen auf die Erscheinung der sogen. Stärkekoagulation. (Kolloid-Zeitschrift, Dresden and Leipzig, 1919, Bd. 25, p. 79-81.) **PKA**

Gives experiments which show that the coagulation by ptyalin is effected by the conversion of the protecting colloid, the starch sol, into sugar, which thereby causes the starch gel to coagulate; the assumption of a coagulating enzyme is thus unnecessary.

Abstract in *Chem. abst.*, 1920, v. 14, p. 949; *Jour. chem. soc.*, 1919, v. 116, part 1, p. 575; *Chem. Zentr.*, 1919, Bd. 3, p. 861.

1389. Reychler, Albert. Notes sur la fécule (suite). (Société chimique de France, Bulletin, Paris, 1921, série 4, tome 29, p. 833-836.) **PKA**

A 2% starch paste was prepared at a temperature of 100°, preserved in ice for 16 days, digested with malt extract at 50° and filtered from the insoluble material which was deposited. This material was dissolved by heating with water at 145-150° and, on cooling, deposited a white, friable substance which was slightly soluble in boiling water and soluble in 0.5N KOH.

Abstract in *Chem. abst.*, 1922, v. 16, p. 171.

1390. — Études sur la fécule. (Société chimique de Belgique, Bulletin, Bruxelles, 1921, tome 30, p. 223-225.) **PKA**

Practically a repetition of the earlier work of Roux (*entry 1372*) except that it is accompanied by numerous microscopical observations. Concludes that the retrogradation process affects principally the parietal matter of the starch grain and that this material is closely related to "artificial

Starches and Dextrins, continued.

Coagulation and Retrogradation, continued.

"arch" or the "amylose" of Maquenne. Re-
rms earlier statement that each starch
in possesses two hila, one on each side
he grain.

1. **Paine, H. H., and G. T. R. EVANS.** method of measuring the rate of coagula-
a of colloidal solutions over wide ranges.
aday Society, Transactions, London,
3-24, v. 19, p. 649-658.) **PPO**

starch solutions are used in the investi-
ion.

Abstract in *Chem. Zentr.*, 1924, Bd. 2, p. 2126.

2. **Amar, Jules.** Coagulation et vie végé-
e. (Académie des sciences, Comptes

rendus, Paris, 1924, tome 178, p. 1317-1319.)

***EO**

Studies coagulating and decoagulating ef-
fects with a 5% starch paste. Various salts,
organic acids, ether, and oil are used.

Abstract in *Chem. abst.*, 1924, v. 17, p. 2361.

1393. **Joszt, Adolf.** Über die Amylokoagu-
lase. (Auszug.) (Chemisches Zentralblatt,
Leipzig and Berlin, 1925, Bd. 1, p. 1327.)

PKA

Also abstracted in *Chem. abst.*, 1925, v. 19,
p. 3094.

1394. ——— Über die Amylokoagulase. 2.
Das Verhältnis der Amylokoagulase zum
stärkeverzuckernden Enzym. (Auszug.)
(Chemisches Zentralblatt, Leipzig and Ber-
lin, 1925, Bd. 1, p. 1327.)

PKA

Also abstracted in *Chem. abst.*, 1925, v. 19, p.
3095.

MICROSCOPIC OBSERVATIONS

5. **Villars, A.** Mémoire sur la structure
la pomme de terre. (Journal général de
decine, Paris, 1811, tome 42, p. 98-114.)

Available in Library of the Surgeon Gen-
er's Office.

Describes the potato starch granules.

5. **Creuzberg, H. Ch.** Beiträge zur
kenntniss der weinigen Gährung amylo-
niger Substanzen. (Journal für praktische
emie, Erdmann's, Leipzig, 1836, Bd. 9,
99-316.) **PKA**

The effect on starch grains is illustrated
diagrams.

7. **Schulze, Franz.** Ueber die Meta-
phose des Amylums. (Annalen der
sik und Chemie, Poggendorff's, Leip-
1836, Bd. 39, p. 489-493.) **PAA**

6. **Biot.** Note sur les phénomènes de
risation produits à travers les globules
lacés. (Académie des sciences, Comptes
us, Paris, 1844, tome 18, p. 795-797.)

***EO**

1. **Ehrenberg.** Ueber die Anwendung
chromatischpolarisirten Lichtes für
oskopische Verhältnisse. (Journal für
tische Chemie, Leipzig, 1850, Bd. 49,
50-511.) **PKA**

number of starches are included among
stances examined.

7. **Martin, A. G. C.** On the amyllum
s of the potatoe. (Philosophical maga-
e, London, 1852, series 4, v. 3, p. 277-
280.) **OA**

8. **Soubeyran, J. Léon.** Études micro-
scopiques sur quelques féculs. (Journal

de pharmacie et de chimie, Paris, 1854, série
3, tome 25, p. 89-105, 175-192.) **WTA**

1402. **Blondlot, N.** Recherches sur la di-
gestion des matières amylacées. (Annales
de chimie et de physique, Paris, 1855, tome
43, p. 223-233.) **PAA**

Contains observations on nature of the
starch granule.

1403. **Rivot.** Note sur l'examen des farines
et des pains. (Annales de chimie et de
physique, Paris, 1856, série 3, tome 47, p.
50-93.) **PAA**

On p. 59-62 details microscopic examina-
tion of starch.

1404. **Lang, Viktor V.** Über das Kreuz,
das gewisse organische Körper im polar-
isirten Lichte zeigen, und über die Hai-
dinger'schen Farbenbüschel. (Annalen der
Physik und Chemie, Poggendorff's, Leip-
zig, 1864, Bd. 123, p. 140-147.) **PAA**

1405. **Wiesner, Julius, and Jos. HÜBL.** Un-
tersuchung der neuen, zur Pariser Welt-
Ausstellung (1867) gesendeten Stärkesor-
ten. 2. (Dingler's polytechnisches Journal,
Augsburg, 1868, Bd. 190, p. 157-169.) **3-VA**

1. Stärkesorten die bloss aus einfachen
Körnern bestehen. 2. Stärkesorten, die der
Hauptmasse nach aus einfachen Körnern
bestehen. 3. Stärkesorten, die bloss aus
zusammengesetzten Körnern bestehen. 4.
Stärkesorten, welche der Hauptmasse nach
aus zusammengesetzten Stärkekörnern
bestehen.

1406. **Schoenn.** Bestimmung der mittleren
Grösse der Stärkemehlkörner. (Dingler's

Starches and Dextrins, continued.

Microscopic Observations, continued.

polytechnisches Journal, Augsburg, 1870, Bd. 195, p. 469-470.) **3-VA**

Condensed in *Wag. Jahr.*, 1870, Jahrg. 16, p. 377-378; *Zeit. anal. Chem.*, 1870, Jahrg. 9, p. 274-275; *Jahresber. Chem.*, 1870, p. 1189-1190.

1407. Magerstein, Th. Physikalisch-chemische Veränderungen der Stärkemehlkörner in den Kartoffeln beim Kochen derselben. (Auszug.) (Chemiker-Zeitung, Cöthen, 1881, Jahrg. 5, p. 288.) **†† VOA**

Also abstracted in *Chem. Centr.*, 1881, p. 288; *Jour. chem. soc.*, 1882, v. 42, p. 422; *Central-Blatt für Agrikulturchemie*, Biedermann's, Leipzig, 1881, Jahrg. 10, p. 791-792.

1408. Schubert, Stanislaus. Über das Verhalten der Stärkekorns beim Erhitzen. (Monatshefte für Chemie, Wien, 1884, Bd. 5, p. 472-487.)

Available in Library of Columbia University.

A microscopical investigation of the changes in form and structure which the dry granules undergo when heated from 160° to 190°.

Abstract in *Jour. chem. soc.*, 1885, v. 48, p. 368; *Ber.*, 1884, Jahrg. 17, p. 479 R; *Wag. Jahr.*, 1884, Jahrg. 30, p. 742-743.

1409. Tschirch, A. Über Stärkemehlanalysen. (Archiv der Pharmacie, Halle, 1884, Bd. 222, p. 921-936.)

Available in Library of Columbia College of Pharmacy.

Microscopical investigation of a large number of starches.

Condensed with illustrations in *Wag. Jahr.*, 1885, Jahrg. 31, p. 649-654.

1410. Buetschli, O. Ueber den feineren Bau der Stärkekörner. (Naturhistorisch-medicinische Verein zu Heidelberg, Verhandlungen, Heidelberg, 1893-97, N. F., Bd. 5, p. 89-102.)

Available in Library of the New York Academy of Medicine.

Found that starch-paste of medium density, on drying, first assumed a honey-comb structure and subsequently a fibrous form. In gelatinous paste, and in a dilute solution of starch that is frozen, the same characteristic honey-combed appearance was noted.

Abstract in *Chem. Centr.*, 1893, Bd. 2, p. 529; *Botanisches Centralblatt*, Cassel, 1893, Bd. 56, p. 150-151.

1411. — Ueber die Herstellung künstlicher Stärke. (Botanisches Centralblatt, Cassel, 1896, Bd. 68, p. 213-214.)

Available in Library of Columbia University.

Obtains spherocrystals of starch by boiling the starch in water for 3 to 4 hours,

filtering, adding an equal volume of a 5% gelatin solution to the filtrate, and evaporating almost to dryness. The spherocrystals thus obtained have a diameter of about 0.05 mm.

1412. Puriewitsch, K. Ueber die Wabenstruktur der pflanzlichen organischen Körper. (Deutsche botanische Gesellschaft, Berichte, Berlin, 1897, Jahrg. 15, p. 239-247.) **QEA**

Opposes the honey-comb theory proposed by Bütschli.

1413. Hefs, Eugen. Untersuchungen einiger tropischer Stärkemehle. (Auszug.) (Chemisches Central-Blatt, Berlin, 1906, Bd. 1, p. 952.) **PKA**

Describes microscopical appearance.

1414. Boutaric, A. Sur les phénomènes présentés par les grains d'amidon en lumière polarisée. (Journal de physique, Paris, 1911, série 5, tome 1, p. 891-896.) **PAA**

Abstract in *Chem. abst.*, 1912, v. 6, p. 826.

1415. Hoyer, Otto. Die Korngrösse der Weizen- und Kartoffelstärke. Eine vergleichende Untersuchung. (Auszug.) (Chemisches Zentralblatt, 1911, Berlin, Bd. 2, p. 305.) **PKA**

Using samples from various sources, it was found that the upper limit of the diameter of the grains of wheat starch is 55μ; that for potato starch is 121μ.

1416. Vilikovski, V. Influence of dry seasons and fertilizers on the size of starch grains of the potato. [Title translated.] (Chemické listy pro vědu a průmysl, V Praze, 1911, ročník 5, p. 412-414.)

Available in Library of the Chemists' Club.

Extremely dry seasons diminish the size of the grains. Potash fertilizers produce the largest grains. — *Chem. abst.*

1417. Kraemer, Henry. The influence of heat and chemicals on the starch grain. (International Congress of Applied Chemistry, 8th, Washington and New York, 1912, Original communications, v. 17, p. 31-35.) **PKR**

By colorations with aniline dyes, with iodine and by polarization effects, has obtained evidence bearing on internal structure of starch grains. Gives conditions for dextrinization.

Also in *American journal of pharmacy*, Philadelphia, 1914, v. 86, p. 81-85.

Abstract in *Chem. abst.*, 1912, v. 6, p. 3205; *ibid.*, 1914, v. 8, p. 1218; *Chem. Zentr.*, 1914, Bd. 1, p. 1016; *Wag. Jahr.*, 1912, Jahrg. 58, Abt. 2, p. 341.

ches and Dextrins, continued.

oscopic Observations, continued.

Tunmann, O. Beiträge zur angeordneten Pflanzenmikrochemie. 4. Notiz über die Anwendung von Jodzuckerlösung. Apotheker-Zeitung, Berlin, 1912, Jahrg. 1912, 261-262.)

Available in Library of Columbia College pharmacy.

Starch grains are colored brown by a potassium-iodine solution.

Reichert, Edward Tyson. The differentiation and specificity of starches in relation to genera, species, etc. Stereochemistry applied to protoplasmic processes and products and as a strictly scientific basis for the classification of plants and animals. Washington: Carnegie Institution, 1913. 342 p. f°. (Carnegie Institution of Washington. Publication no. 173, part 1.)

*EA

The object of this work is to show that starch producing plants become modified in their botanical characters, the properties of the complex synthesized substances, such as starch, are accordingly modified and hence that every genus and species has a form of starch which is specific and constant in relation to that genus and species. The occurrence of this vast number of chemical forms is accounted for by assuming that starch exists: (1) in forms and isomers having structural formulae which differ so little that they exhibit the typical characteristics of a given prototype; (2) in forms of stereoisomerism; and (3) in mechanical mixtures of 2 or more isomers or isomers.

Includes historical review dealing with the substance, the primary and reverted composition products of starch, and the structure, form and mechanism of formation of the starch grain. Outlines chief methods and classifications of starch-grains, including Liden's, Meyer's, Muter's, Kraemer's, Tyson's and Nägeli's classifications being included; the latter is printed in full detail and is a direct translation of chap. 12 of Nägeli's memoir (entry 524). Histological, chemical and physical characteristics of 306 starches are determined. For each of the starches 2 photomicrographs are given showing appearance under ordinary and polarized light at a magnification of 300 times.

— The differentiation and specificity of starches in relation to genera, species, etc. Stereochemistry applied to protoplasmic processes and products, and as a scientific basis for the classification of plants and animals. Washington: Carnegie Institution, 1913. 558 p. f°. (Carnegie

Institution of Washington. Publication no. 173, part 2.)

*EA

Further details concerning determination of the various histological, physical and chemical characteristics; final results have been graphically expressed in part 1. For each starch the following characteristics are determined: form and appearance of the grains, character of hilum and lamellae, size of grain, polariscopic properties, degree of polarization, color effects in the presence of a selenite plate, color with very dilute I-KI solutions as the grains undergo rupture, staining reactions with gentian violet and safranin, temperatures of gelatinization and effect of the reagents chloral hydrate-iodine, chromic acid, pyrogallol acid, ferric chloride, and Purdy's solution. Four hundred charts are given showing curve of reaction intensity of the starches.

1421. Arbaumont, J. d'. Sur la formation de l'amidon dans les organes souterrains de quelques espèces herbacées. (Société botanique de France, Bulletin, Paris, 1914, tome 61, p. 347-351.)

QEA

Aside from concentric development of the starch grain there is also (a) a peripheral phase developing centripetally and (b) a phase developing centripetally and centrifugally at the same time from the periphery and the center, respectively. — *Chem. abst.*

1422. Reuss, A. Über Spaltenbildung bei Stärkekörnern. (Zeitschrift für Untersuchung der Nahrungs- und Genussmittel, Berlin, 1916, Bd. 32, p. 269-270.)

VTa

Gives photographs showing the fissures developed in starch grains after they have remained for one or two days in various aqueous solutions.

Abstract in *Chem. abst.*, 1917, v. 11, p. 220; *Chem. Zentr.*, 1916, Bd. 2, p. 961.

1423. Sawamura, S. Relation between the size of starch-granules and the saccharification and viscosity of the starch pastes. [Title translated.] (Nōgaku Kwai Hō [Journal of the Scientific Agricultural Society, Tokyo, 1918, no. 195.]

Available in Library of the Department of Agriculture.

A number of photomicrographs are given.

1424. Reichert, Edward Tyson. A biochemical basis for the study of problems of taxonomy, heredity, evolution, etc., with especial reference to the starches and tissues of parent-stocks and hybrid-stocks and the starches and hemoglobins of varieties, species, and genera. Washington: Carnegie Institution of Washington, 1919. 854 p., 34 pl. 4°. (Carnegie Institution of Washington. Publication no. 270.)

*EA

Abstract in *Chem. abst.*, 1920, v. 14, p. 2496.

Starches and Dextrins, continued.

Microscopic Observations, continued.

1425. Scheffer. Über den Nachweis von mechanischen Beschädigungen der Stärkekörner. (Auszug.) (Chemisches Zentralblatt, Berlin, 1919, Bd. 4, p. 749.) **PKA**

The grains are examined by means of the iodine coloration and by polarized light.

1426. Gillis, J. Interprétation des propriétés optiques des grains d'amidon en lumière polarisée. (Société chimique de Belgique, Bulletin, Bruxelles, 1921, tome 30, p. 114-119.) **PKA**

A starch grain formed of superposed concentric layers which are distinctly visible produces a "depolarization" of polarized light, except at the points where the tangent of each layer is parallel or perpendicular to the ray of light, and it is at these points that the black bars are observed. The bars intersect at the hilum, where the layers are smallest in size. — *Chem. abst.*

Abstract in *Chem. Zentr.*, 1921, Bd. 3, p. 550; *Bull. soc. chim. France*, 1921, série 4, tome 30, p. 1165.

1427. — Le hile du grain de fécule. (Société chimique de Belgique, Bulletin, Bruxelles, 1921, tome 30, p. 266-267.) **PKA**

1428. Lindner, Paul. Die Bestimmung der Durchschnittsgrösse von Mikroben, Stärke und dergl. mit Hilfe mikrophotographischer Aufnahmen. (Zeitschrift für technischen Biologie, Leipzig, 1921, Bd. 8, p. 47-51.) **PPH**

Abstract in *Chem. Zentr.*, 1920, Bd. 4, p. 454.

1429. Gillis, J. Starch and its optical properties. (Abstract.) (Chemical abstracts, Easton, 1922, v. 16, p. 3554.) **PKA**

1430. Hausman, L. A. Microscopy of foods; a study of starch, the world's premier alimental substance. (Scientific American, New York, 1922, v. 127, p. 256-257.) † **VA**

Illustrations and diagrams are given.

1431. Parow, Edmund. Die Grösse der Stärkekörner verschiedener Kartoffelsorten und ihre Bedeutung für die Kartoffelver-

wertung. (Umschau, Frankfurt, 1922, Jahrg. 26, p. 692-696.) **OA**

A popular science article. Microphotographs are included.

1432. Reyckler, Albert. Sur le grain de fécule. (Société chimique de Belgique, Bulletin, Bruxelles, 1922, tome 31, p. 18-22.) **PKA**

In a reply to Gillis (*entry 1426*) discusses (1) the phenomenon of crystalline birefringence and its bearing on the optical properties of the starch granules; (2) examination of moving granules; and (3) the special nature of a form of granule obtained by rasping potatoes under water.

1433. Buchanan, J. H., and G. G. NAUDAIN. Influence of starch on strength of wheat flour. (Industrial and engineering chemistry, Easton, 1923, v. 15, p. 1050-1051.) **VOA**

Measure the size of starch grains by means of a high-power microscope equipped with a micrometer eyepiece. Tests on 7 typical flour samples indicate the size of the grains is a factor in determining strength of flour, the smaller grains indicating the stronger flour.

Abstract in *Chem. Zentr.*, 1924, Bd. 1, p. 111.

1434. Fall, C. B. New micro-photographs of the more common starches. (Chemical age, New York, 1923, v. 31, p. 37-39.) † **VOA**

Photomicrographs of 11 kinds of starches are given. Soy bean starch was prepared from pure meal by successive extraction with CCl_4 , H_2O , 10% NaCl solution, 0.2% HCl solution, and $\text{C}_2\text{H}_5\text{OH}$. — *Chem. abst.*

1435. Reyckler, Albert. Un dernier mot sur le grain de fécule. (Société chimique de Belgique, Bulletin Bruxelles, 1923, année 32, p. 228-229.) **PKA**

Describes an experiment which disproves author's previous theory as to the starch granule possessing two hila.

Abstract in *Jour. soc. chem. ind.*, 1923, v. 42, p. 672A.

1436. Zwikker, J. J. L. Specificity in the forms of starch grains. (Abstract.) (Chemical abstracts, Easton, 1923, v. 17, p. 3924.) **PKA**

ANALYTICAL SECTION

METHODS OF DETERMINATION

1437. Luedersdorff. Nachträgliche Bemerkungen über die Ausmittlung des Stärkegehalts der Kartoffeln. (Dingler's polytechnisches Journal, Stuttgart, 1841, Bd. 79, p. 313-315.) **3-VA**

1438. Briois. Système de dosage de la

fécule par l'action des acides acétique et tartarique. (Académie des sciences, Comptes rendus, Paris, 1854, tome 39, p. 755.) * **EO**

A brief note. Starch is determined by dissolving in an organic acid and precipitating by alcohol or by a base.

Starches and Dextrins, continued.

Methods of Determination, continued.

Cailletet, Dosage de la fécule de pomme de terre mélangée à la farine de (Académie des sciences, Comptes rendus, Paris, 1854, tome 39, p. 246.) *EO

The sample is mixed with aqueous KOH alcoholic bromine added; the volume of resulting precipitate serves to determine relative amounts of the two materials. Abstract in *Jahresber. Chem.*, 1854, p. 748.

Monier, E. Analyse du lait au moyen de la seule liqueur titrée. Essai des farines de caméléon minéral. (Académie des sciences, Comptes rendus, Paris, 1858, tome 46, p. 425-426.) *EO
Abstract in *Jour. prakt. Chem.*, 1858, Bd. 73, p. 480.

Gentele, J. G. Ueber die Bestimmung des Traubenzuckers, Rohrzuckers und Dextrins in ihren Mischungen. (Dingler's polytechnisches Journal, Stuttgart and Leipzig, 1859, Bd. 152, p. 68-71.) 3-VA
Abstract in *Chem. Centr.*, 1859, Jahrg. 4, p. 504.

Payen, A. De l'amidon et de la cellulose. (Journal de chimie et de pharmacie, Paris, 1859, série 3, tome 35, p. 106-107.) WTA

Foreign materials are removed by means of cupro-ammonium and the volume of gas determined after deposition.

Abstract in *Société chimique de Paris, Rép. chimie française*, 1858-59, tome 1, p. 144; *Wag. Jahr.*, 1859, Jahrg. 5, p. 322-323.

Nobbe, Friedrich. Das Äussere der Kartoffel als Kennzeichen ihres Stärkegehalts. (Landwirtschaftlichen Vereins-Stationen, Chemnitz, 1864, Bd. 6, p. 418.)

Available in Library of the Department of Agriculture.

Nessler, J. Ueber Prüfung der Kartoffeln. (Dingler's polytechnisches Journal, Stuttgart and Leipzig, 1871, Bd. 200, p. 342-344.) 3-VA

Hilger, A. Die Bestimmung des Stärkegehalts der Kartoffeln. (Ausgabe des Jahresbericht der Chemie, Giessen, 1881, p. 1031.) PKA

Results that results obtained by the Hurler method are about 1/2% too high.

Hayduck, M. Zur Bestimmung des Stärkegehalts der Presshefe. (Ausgabe des Central-Blatt für Agrikulturchemie, Hermann's, Leipzig, 1881, Jahrg. 10, p. 144.)

Available in Library of the Department of Agriculture.

Abstracted in *Jour. chem. soc.*, 1881, v. 40,

1447. Kratschmer, F. Beiträge zur quantitativen Bestimmung von Glykogen, Dextrin und Amylum. (Archiv für die gesamte Physiologie des Menschen und der Tiere, Pflüger's, Bonn, 1881, Bd. 24, p. 134-164.) QCA

1448. Wolff, C. H. Quantitative Bestimmung eines Gehaltes von Stärkesirup im braunen Zuckersirup. (Pharmaceutisches Centralhalle, Berlin, 1882, Jahrg. 23, p. 491-492.)

Available in Library of Columbia College of Pharmacy.

1449. Bensemman, R. Beiträge zur quantitativen Analyse der Schokolade. (Auszug.) (Chemisches Central-Blatt, Hamburg und Leipzig, 1883, p. 633.) PKA

1450. Gawalowski, A. Ueber eine praktisch erprobte Reconstruction der Lintner'schen Druckflasche. (Zeitschrift für analytische Chemie, Wiesbaden, 1883, Jahrg. 22, p. 526-527.) PKA

A soda water bottle is used.

1451. Kalt, H. P. Ueber Stärkebestimmung in Getreidearten. (Zeitschrift für Spiritusindustrie, Berlin, 1884, N. F., Jahrg. 7, p. 820-821.)

Available in Library of the Patent Office.

Abstract in *Wag. Jahr.*, 1884, Jahrg. 30, p. 745.

1452. Mallat, A. Sur le dosage de l'amidon dans le pain de gluten. (Journal de pharmacie et de chimie, Paris, 1884, série 5, tome 10, p. 114-116.)

Available in Library of Columbia College of Pharmacy.

1453. Obermann, Richard F. Quantitative estimation of dextrin and starch in barley and of dextrin, maltose and starch in malt. (Weekly drug news and American pharmacist, New York, 1884, v. 8, p. 91-92.)

Available in Library of Columbia College of Pharmacy.

Abstract in *Chem. Centr.*, 1884, p. 232.

1454. Soxhlet, F. Stärkebestimmungsmethode. (Auszug.) (Jahres-Bericht der chemischen Technologie, Wagner's, Leipzig, 1885, Jahrg. 31, p. 864-865.) VOA

1455. Spitzer, J. Die Bestimmung der unaufgeschlossenen Stärke in süßen Maischen. (Zeitschrift für Spiritusindustrie, Berlin, 1885, N. F., Jahrg. 9, p. 57.)

Available in Library of the Patent Office.

Abstract in *Ding. poly. Jour.*, 1886, Bd. 260, p. 144; *Jahresber. Chem.*, 1886, p. 2145; *Jour. chem. soc.*, 1886, v. 50, p. 746.

Starches and Dextrins, continued.

Methods of Determination, continued.

1456. Rempel, R. Apparate für Stärke-mehlbestimmungen. (Deutsche chemische Gesellschaft, Berichte, 1885, Jahrg. 18, p. 621-624.) **PKA**

Describes pressure flask and air bath. Gives 3 diagrams.

1457. Landwehr, H. A. Über die Fällung des Dextrins durch Eisen. (Archiv für die gesammte Physiologie, Pflüger's, Bonn, 1886, Bd. 38, p. 321-325.) **QCA**

In opposition to Nasse, author maintains the possibility of separating gum and glycogen from dextrin, by precipitating ferric oxide in the liquid; the two former being thrown down, and the dextrin remaining in solution.

Abstract in *Jour. chem. soc.*, 1887, v. 52, p. 401; *Chem. Centr.*, 1886, p. 954.

1458. Asbóth, Alexander von. Neue Methode zur quantitativen Bestimmung der Stärke. (Repertorium der analytischen Chemie, Hamburg, 1887, Jahrg. 7, p. 299-308.)

Available in Library of Chemists' Club.

Based on the formation of a sparingly soluble barium salt of starch. Excess baryta solution is used and titrated back with acid. Gives a full analysis of some of the more important cereals.

Translation in the *Analyst*, London, 1887, v. 12, p. 138-142.

Abstract in *Jour. soc. chem. ind.*, 1887, v. 6, p. 608; *Wag. Jahr.*, 1887, Jahrg. 33, p. 864-866.

1459. — Zur quantitativen Bestimmung der Stärke. (Chemiker-Zeitung, Cöthen, 1887, Jahrg. 11, p. 785-786.) **†† VOA**

Supplementary to *entry 1458*.

1460. — Ueber die Stärkebestimmungs-Methoden. (Chemiker-Zeitung, Cöthen, 1888, Jahrg. 12, p. 693-694.) **†† VOA**

The author replies to Monheim's and Seyfert's criticisms (*entry 1465*) of his earlier article.

1461. Goldmann. Über Stärkebestimmungen in Vegetabilien etc. (Auszug.) (Chemisches Central-Blatt, Hamburg und Leipzig, 1888, p. 27.) **PKA**

Claims that in the method of Zipperer cellulose is rendered soluble by the digestion. Recommends a shorter period of digestion at a lower temperature.

Also abstracted in *Jour. soc. chem. ind.*, 1888, v. 7, p. 348.

1462. Lintner, Carl J. Über Verbindungen der Stärke mit den alkalischen Erde. (Zeit-

schrift für angewandte Chemie, Leipzig, 1888, p. 232-236.)

Available in Library of Chemists' Club.

Investigates precipitation of starch and dextrins with Ca, Ba and Sr hydroxide solutions. Some of the determinations are carried out in sugar and alcohol solutions. As the composition and the amount of precipitate vary with the quantity of the precipitant used, concludes that reliable analytical results cannot be obtained by these reagents.

Abstract in *Jour. chem. soc.*, 1889, v. 56, p. 316; *Wag. Jahr.*, 1888, Jahrg. 34, p. 839; *Chem. Centr.*, 1888, p. 778; *Ber.*, 1888, Jahrg. 21, p. 454.

1463. Monheim, C. Zur Asboth'schen Stärkebestimmung. (Zeitschrift für angewandte Chemie, Berlin, 1888, Jahrg. 1, p. 401.)

Available in Library of the Chemists' Club.

Maintains that the method of Asboth is unreliable.

Abstract in *Chem. Centr.*, 1888, p. 1137.

1464. Pannetier, A. La dextre dans les extraits pharmaceutiques. (Journal de pharmacie et de chimie, Paris, 1888, série 5, tome 17, p. 58-59.)

Available in Library of Columbia University.

Basic lead acetate is used to precipitate dextrin, which is present as an adulteration.

Abstract in *Chem. Centr.*, 1888, p. 295.

1465. Seyfert, Friedrich. Über die Bestimmung von Stärke mittels Baryts. (Zeitschrift für angewandte Chemie, Berlin, 1888, Jahrg. 1, p. 126-129.)

Available in Library of the Chemists' Club.

Finds an error involved in the filtration due to action of CO₂ of the air. Recommends that the precipitate be allowed to settle and an aliquot portion of the supernatant liquid be drawn off. Finds results are not influenced by time required for settling of precipitate but are considerably influenced by amount of alcohol present after precipitation.

Abstract in *Jour. soc. chem. ind.*, 1888, v. 7, p. 350; *Wag. Jahr.*, 1888, Jahrg. 34, p. 839.

1466. Spence, J. N. Estimation of starch. (Society of Chemical Industry, Journal, London, 1888, v. 7, p. 77-78.) **VOA**

Modifies the baryta method of Asboth (*entry 1458*).

Abstract in *Jour. chem. soc.*, 1888, v. 54, p. 632; *Chem. Centr.*, 1888, p. 502.

1467. Stutzer, A., and A. Isbert. Untersuchungen über das Verhalten der in Nahrungs- und Futtermitteln enthaltenen Kohlehydrate zu den Verdauungsfermenten.

Starches and Dextrins, continued.

Methods of Determination, continued.

Zeitschrift für physiologische Chemie,
Hoppe-Seyler's, Strassburg, 1888, Bd. 12, p. 94.)

PKA

seek to determine undigestible carbohydrates and proteids in foodstuffs by observing residues left after successive diastatic and peptic digestions. Ptyalin, malt diastase and pancreatin are used in the experiments.

Abstract in *Jour. chem. soc.*, 1888, v. 54, p. 170-
Chem. Centr., 1887, p. 1551.

8. Asboth, Alexander von. Ueber die Stärkebestimmungs-Methoden. (*Chemiker-Zeitung*, Cöthen, 1889, Jahrg. 13, p. 591, 592.)

†† **VOA**

recommends a preliminary extraction with ether when using the baryta method for determination of starch in grain meal or rice.

reprinted in the *Analyst*, London, 1889, v. 14, p. 139, 156-157, **PKA**.

Abstract in *Jour. soc. chem. ind.*, 1889, v. 8, p. 264.

9. Vulté, H. T. The analysis of grains and cereals. (New York Academy of Sciences, Transactions, New York, 1890-91, vol. 1, p. 24-27.)

***EA**

includes a detailed description of von Vulté's method for determination of starch.

10. Bau, Arminius. Ueber die Zusammensetzung der Bierwürzen in Bezug auf Maltosehydrate. (*Wochenschrift für Brauerei*, Berlin, 1891, Jahrg. 8, p. 1-11.)

Available in Library of the Brewers' Society.

includes method for determination of dextrins and amyloins.

Abstract in *Chem. Centr.*, 1891, Bd. 1, p. 513.

11. Elion, H. Die Bestimmung von Maltose, Dextrose und Dextrin in Bierwürzen. (Bier mittels Reinkulturen von Gärungsorganismen. (*Centralblatt für Bakteriologie und Parasitenkunde*, Jena, 1891, Bd. 9, p. 525-528.)

QDA

Abstract in *Jour. chem. soc.*, 1892, v. 62, p. 248; *Chem. Centr.*, 1891, Bd. 2, p. 281.

12. Crossman, T. Composition and analysis of malt. (American Chemical Society, Journal, Easton, 1894, v. 16, p. 559-565.)

PKA

includes importance and method of determination of "unmodified" starch.

Abstract in *Jour. soc. chem. ind.*, 1895, v. 14, p. 289.

13. Macfarlane, Thomas. On the estimation of starch. (Royal Society of Canada,

Proceedings and transactions, Ottawa, 1895, series 2, v. 1, section 3, p. 19-23.)

***EC**

1474. Bujard, Alfons. Zur Stärke- und Glykogenbestimmung in Fleischwaren. (*Forschungs-Berichte über Lebensmittel*, München, 1897, Jahrg. 4, p. 47-48.)

Available in Library of the Department of Agriculture.

Abstract in *Chem. Centr.*, 1897, Bd. 1, p. 671.

1475. Mayrhofer, Joseph. Zur Stärkebestimmung in Wurstwaren. (*Forschungs-Berichte über Lebensmittel*, München, 1897, Jahrg. 4, p. 48-49.)

Available in Library of the Department of Agriculture.

Confirms observations of Bujard.

Abstract in *Chem. Centr.*, 1897, Bd. 1, p. 775.

1476. Tryller, H. Eine Modification der Eiweissstickstoffbestimmung nach Stutzer für stärkereiche Substanzen. (*Chemiker-Zeitung*, Cöthen, 1897, Jahrg. 21, p. 54.)

†† **VOA**

The starch is removed by gelatinizing and heating at 65° with malt extract.

Abstract in *Jour. soc. chem. ind.*, 1897, v. 16, p. 264.

1477. Krug, William H., and HARVEY W. WILEY. Solubility of pentosans in the reagents employed in the estimation of starch. (*American Chemical Society, Journal*, Easton, 1898, v. 20, p. 266-268.)

PKA

Determinations using salicylic and lactic acids under pressure give high results due to the degradation of pentosans and hemicelluloses. Contrary to the observations of König, diastase has no solvent action on pentosans.

Abstract in *Jour. soc. chem. ind.*, 1898, v. 17, p. 498; *Chem. Centr.*, 1898, Bd. 1, p. 1072; *Bull. soc. chim. Paris*, 1899, série 3, tome 22, p. 184.

1478. Browne, C. A. Estimation of starch. (United States.—Department of Agriculture, Chemistry bulletin, Washington, no. 57, 1899, p. 92-94.)

VPH

1479. Glendinning, T. A. Some practical aspects of the fermentable matter in beer. (*Federated Institutes of Brewing, Journal*, London, 1899, v. 5, p. 21-32.)

VTRA

Fermentable constituents of beer are determined by observing the cupric reducing power and optical rotation before and after fermentation. From the results obtained, the percentages of maltose and dextrin may be calculated.

Abstract in *Jour. soc. chem. ind.*, 1899, v. 18, p. 289.

1480. Bianchi, A. Ueber die quantitative Bestimmung der Zuckerarten bei Gegenwart von Dextrin. (Österreich-ungarische

*Starches and Dextrins, continued.**Methods of Determination, continued.*

Zeitschrift für Zuckerindustrie und Landwirtschaft, Wien, 1900, Jahrg. 29, p. 515-520.)

Available in Library of the Department of Agriculture.

Has examined the methods of Wiley, Sachsse and Lieben; also attempted to separate dextrin from sugars by baryta and by alcohol.

Abstract in *Jour. soc. chem. ind.*, 1900, v. 19, p. 1152; *Chem. Centr.*, 1900, Bd. 2, p. 822.

1481. Matthews, Charles G., and A. HYDE PARKER. Analysis of a sample of treacle and of so-called golden syrup. (*Analyst*, London, 1900, v. 25, p. 89-98.) **PKA**

Include determination of maltose, dextrose and dextrin.

Abstract in *Jour. soc. chem. ind.*, 1900, v. 19, p. 548.

1482. Pellet, H. Analyse des glucoses commerciaux, dosage du sucre cristallisable en présence de la levulose, de la dextrose et de la dextrine. (*Association des chimistes de sucrerie et de distillerie*, Bulletin, Paris, 1900-01, tome 18, p. 769-773.) **VOA**

Abstract in *Jour. soc. chem. ind.*, 1901, v. 20, p. 754.

1483. Mayrhofer, Joseph. Über die quantitative Bestimmung von Glykogen und Stärke in Wurst- und Fleischwaren. (*Zeitschrift für Untersuchung der Nahrungs- und Genussmittel*, Berlin, 1901, Bd. 4, p. 1101-1106.) **VT A**

Glycogen is separated from starch by dissolving in 49% alcohol.

Abstract in *Jour. chem. soc.*, 1902, v. 82, part 2, p. 180; *Chem. Centr.*, 1902, Bd. 1, p. 228.

1484. Meunier, J. Sur le procédé de M. Lindet pour doser le dextrose et la dextrine dans les glucoses commerciaux. (*Société chimique de Paris*, Bulletin, 1901, série 3, tome 25, p. 250-251.) **PKA**

Suggests that the method of Lindet may be shortened by determining total carbohydrates calorimetrically rather than by elementary analysis. Naphthalene is used as an accelerator in carrying out the combustion determinations.

Abstract in *Chem. Centr.*, 1901, Bd. 1, p. 799.

1485. Hoenig, Max. Ueber Zusammensetzung und Untersuchung von Stärkesyrupen. (*Zeitschrift für Untersuchung der Nahrungs- und Genussmittel*, Berlin, 1902, Bd. 5, p. 641-653.)

Available in Library of the Chemists' Club.

Dextrins are separated from solutions of starch syrups by addition of saturated

baryta solution and alcohol. A dextrin is investigated, which is probably a reversion product of glucose. Gives a scheme for analysis of commercial starch syrups.

Abstract in *Jour. soc. chem. ind.*, 1902, v. 21, p. 1100.

1486. Mayrhofer, Joseph. Dosage du glycogène et de l'amidon dans les saucissons et la charcuterie. (*Revue internationale des falsifications*, Paris, 1902, année 15, p. 13-16.) **† VTD**

1487. Roessing, A. Beiträge zur Untersuchung der Stärkesirupe. (*Zeitschrift für öffentliche Chemie*, Plauen, 1903, Jahrg. 9, p. 133-142.) **VOA**

Abstract in *Chem. Centr.*, 1903, Bd. 1, p. 1378; *Jour. soc. chem. ind.*, 1903, v. 22, p. 886.

1488. Boidin, A. Autoclave pour dosages d'amidon. (*Association des chimistes*, Bulletin, Paris, 1904-05, tome 22, p. 324-325.) **VOA**

Describes a small autoclave in which an aqueous suspension of the sample is placed and the apparatus submerged in a bath at 135-150°. An atmosphere of CO₂ is used in order to prevent oxydation of the metal.

Abstract in *Chem. Centr.*, 1904, Bd. 2, p. 1755.

1489. Roessing, Adelbert. Beiträge zur Untersuchung der Stärkesirupe. (*Zeitschrift für öffentliche Chemie*, Plauen, 1904, Jahrg. 10, p. 1-7.) **VOA**

Abstract in *Jour. soc. chem. ind.*, 1904, v. 23, p. 386.

1490. — Beiträge zur Untersuchung der Stärkesirupe. (*Zeitschrift für öffentliche Chemie*, Plauen, 1904, Jahrg. 10, p. 277-279.) **VOA**

Abstract in *Jour. soc. chem. ind.*, 1904, v. 23, p. 953; *Chem. Centr.*, 1904, Bd. 2, p. 855.

1491. Kickton, A., and R. MURDFIELD. Über den praktischen Wert der Glykogenbestimmung zum Nachweise von Pferdefleisch. (*Zeitschrift für Untersuchung der Nahrungs- und Genussmittel*, Berlin, 1907, Bd. 14, p. 501-511.)

Available in Library of the Chemists' Club.

Starch and glycogen are separated by method of Baur and Polenske.

Abstract in *Chem. abst.*, 1908, v. 2, p. 1164; *Chem. Centr.*, 1907, Bd. 2, p. 1868.

1492. Koenig, F. Josef, and P. HÖRMANN. Trennung der Kohlenhydrate durch Reinehen. (*Zeitschrift für Untersuchung der Nahrungs- und Genussmittel*, Berlin, 1907, Bd. 13, p. 113-132.)

Available in Library of the Chemists' Club.

Fermentation methods described include separation of dextrose from maltose and

ches and Dextrins, continued.

Methods of Determination, continued.

Separation of dextrose and maltose from tritin.

Abstract in *Chem. abst.*, 1907, v. 1, p. 1185; *Jour. chem. ind.*, 1907, v. 26, p. 215; *Jour. chem. soc.*, v. 92, part 2, p. 202; *Chem. Zentr.*, 1907, Bd. 843.

3. **Huggenberg, C.** Die Bestimmung Stärke in Seife. (Seifenfabrikant, Berlin, 1907, Jahrg. 27, p. 625-626.) †3-VOA

4. **Biourge, Ph.** Zur Stärkebestimmung. Lösung der Stärke durch Trichloressigsäure. (Abgekürzt.) (Zeitschrift für das gesamte Brauwesen, München und Leipzig, 1908, Jahrg. 31, p. 277.)

Available in Library of the Chemists' Club.

Starch is dissolved by a 3% solution of hydrochloric acid and precipitated by baryta and alcohol or by iodine and magnesium sulfate.

Abstract in *Jour. soc. chem. ind.*, 1908, v. 27, p. 433.

5. **O'Sullivan, James.** Improvement in method of malt analysis. (Institute of Brewing, Journal, London, 1911, v. 17, p. 43.) VTRA

Discussion, p. 43-48.

Determines composition of the starch transformation products in the standard brewer's extract, and the transforming power of the malt, that is, the percentage maltose produced, referred to the starch in the malt.

Abstract in *Jour. soc. chem. ind.*, 1911, v. 30, p. 464.

6. **Deprax, Paul.** La détermination de l'amidon dans les drêches. (Annales de la brasserie et de la distillerie, Paris, 1911, série 14, p. 505-507.)

Available in Library of the Department of Agriculture.

Proposes a modification of Kreutzer's method.

Abstract in *Bull. assoc. chimistes*, 1911-12, tome 464.

7. **Greifenhagen, W., and others.** Bestimmung der Kohlenhydrate durch Oxydation mittels Kaliumpermanganat in alkalischer Lösung. Von W. Greifenhagen, J. H. Sig und A. Scholl. (Biochemische Zeitschrift, Berlin, 1911, Bd. 35, p. 169-193.) PPB

The method is also applicable to starch.

Abstract in *Jour. soc. chem. ind.*, 1911, v. 30, p. 464; *Chem. abst.*, 1912, v. 6, p. 1015; *Jour. chem. ind.*, 1911, v. 100, part 2, p. 1037.

8. **Hartwich, C., and A. WICHMANN.** Neue Beobachtungen an Stärkekörnern über die Zählkammer, ein Hilfsmittel

zur quantitativen Ermittlung von Verfälschungen vegetabilischer Pulver. (Archiv der Pharmazie, Berlin, 1911-12, Bd. 250, p. 450-471.)

Available in Library of Columbia College of Pharmacy.

Describes an apparatus for counting the starch grains in a drug or spice.

Abstract in *Chem. abst.*, 1913, v. 7, p. 534; *Chem. Zentr.*, 1912, Bd. 2, p. 1695.

1499. **Hérics-Tóth, I. V., and A. v. OSZTRÓVSKY.** Bestimmung des Zucker- und Stärkewertes durch Gärung. (Zeitschrift für Spiritusindustrie, Berlin, 1913, Jahrg. 36, p. 195.) †† VTZA

The values obtained by the fermentation agree with those obtained by the method of Weiser and Zaitschek.

Abstract in *Chem. abst.*, 1913, v. 7, p. 3386; *Chem. Zentr.*, 1913, Bd. 1, p. 2004; *Wag. Jahr.*, 1913, Jahrg. 59, Abt. 2, p. 428.

1500. **Houdt, J. van.** Mémoire concernant le dosage de l'amidon. (Extrait.) (Société chimique de Belgique, Bulletin, Gand, 1913, tome 27, p. 29.) PKA

Discussion.

1501. **Bromley, Henry A.** Analytical processes for papermakers. 2. The examination of sizings—tests for glue, casein, rosin and starch. (Paper, New York, v. 16, Sept. 8, 1915, p. 13-16.) VMPPA

Gives method for quantitative determination of starch.

1502. **Street, J. P., and E. M. BAILEY.** The carbohydrates and the enzymes of the soy bean. (Journal of industrial and engineering chemistry, Easton, 1915, v. 7, p. 853-858.) VOA

Attempt a quantitative determination of the starch, dextrin, glucose and other carbohydrates in the soy bean. The finely ground meal is treated successively with boiling 95% alcohol, cold water, malt extract, 1% HCl and 1.25% NaOH, the amount of carbohydrate removed by each of these solvents being determined.

Abstract in *Chem. Zentr.*, 1915, Bd. 2, p. 1255.

1503. **Davis, William A.** The use of enzymes and special yeasts in carbohydrate analysis. Estimation of starch. (Society of Chemical Industry, Journal, London, 1916, v. 35, p. 207-210.) VOA

A review.

1504. **Gerum, J.** Über den Ausmahlungsgrad des Roggenmehles. (Zeitschrift für Untersuchung der Nahrungs- und Genussmittel, Berlin, 1916, Bd. 31, p. 176-180.) VTZA

The determination of total non-starches is considered to be the best method for

Starches and Dextrins, continued.

Methods of Determination, continued.

judging the grade of flour; starch is determined by the method of Lehmann and Schowalter and the non-starches obtained by difference.

Abstract in *Chem. abst.*, 1917, v. 11, p. 2939; *Chem. Zentr.*, 1916, Bd. 1, p. 1179.

1505. Fellenberg, Th. von. Die Stärkebestimmung in Kleie. Nachtrag zu der Arbeit: "Eine direkte, allgemein anwendbare Stärkebestimmungsmethode." (Mitteilungen aus dem Gebiete der Lebensmitteluntersuchung und Hygiene, Bern, 1917, Bd. 8, p. 55-56.)

Available in Library of the Department of Agriculture.

This modification intends to obviate difficulties in precipitation of starch due to action of protective colloids.

Abstract in *Jour. chem. soc.*, 1917, v. 112, part 2, p. 515; *Chem. Zentr.*, 1917, Bd. 1, p. 1151.

1506. Koltzoff, I. M. Qualitative analyse van een koolhydraatmengsel. (Pharmaceutisch weekblad, Amsterdam, 1917, jaarg. 54, p. 205-214.)

Available in Library of Columbia College of Pharmacy.

Starch and dextrin are included in the scheme of analysis.

Abstract in *Chem. Zentr.*, 1917, Bd. 2, p. 248.

1507. Clark, Frederick C. T.A.P.P.I. report on paper testing. (Paper, New York, 1919, v. 25, p. 777-780, 829-831, 877-879.)

†† **VMFA**

For the quantitative determination of starch and dextrin the method of Kamm and Voorhees is recommended and described.

1508. Kaulfersch, Ferdinand. Über die Bestimmung von in Zellmembranen eingeschlossener Stärke mit Hilfe von Kupferoxydammoniak. (Zeitschrift für Untersuchung der Nahrungs- und Genussmittel, Berlin, 1920, Bd. 39, p. 344-346.)

VTA

In determining starch in sardine paste, ammoniacal cupric hydroxide is used to render the starch accessible.

Abstract in *Chem. abst.*, 1920, v. 14, p. 3112; *Chem. Zentr.*, 1920, Bd. 4, p. 518; *Chimie et industrie*, 1921, v. 5, p. 531.

1509. Nagel. Zur Untersuchung stärkehaltiger Kleister und Leime. (Zeitschrift für Spiritusindustrie, Berlin, 1920, Jahrg. 43, p. 129.)

†† **VTZA**

Gives methods for determining starch when associated with various inorganic materials.

Abstract in *Chem. abst.*, 1920, v. 14, p. 2275.

1510. Eckhardt, F. Die Untersuchung der Treber. (Zeitschrift für das gesamte Brauwesen, Nürnberg, 1921, Jahrg. 44, p. 81-84, 89-92, 97-101, 103-106, 111-115.)

† **VTRA**

Includes discussion on determination of starch.

1511. Behre, A. Die Methoden der Kunsthoniguntersuchung, insbesondere der Bestimmung der Saccharose und des Stärkesirups. (Zeitschrift für Untersuchung der Nahrungs- und Genussmittel, Berlin, 1922, Bd. 43, p. 24-44.)

VTA

Discusses determination of total solids by refractometer, determination of starch syrup by polarimetric and iodine methods, and determination of sucrose by the Clerget-Fehling, polarimetric and iodine methods.

Abstract in *Jour. soc. chem. ind.*, 1922, v. 41, p. 429A; *Chem. Zentr.*, 1922, Bd. 4, p. 67.

1512. Bruhns, G. Über die Bestimmung der Dextrose in Zuckergemischen, insbesondere im Kunsthonig. (Chemiker-Zeitung, Cöthen, 1923, Jahrg. 47, p. 333-335, 358-360.)

†† **VOA**

Starch syrup in 23 samples has been determined by the methods of Behre and of Juckenack and Pasternack. Results indicate that both methods are unreliable.

Abstract in *Jour. soc. chem. ind.*, 1923, v. 42, p. 567-568A; *Chem. abst.*, 1924, v. 18, p. 762; *Chem. Zentr.*, 1923, Bd. 4, p. 118.

1513. Koltzoff, I. M. Die Anwendung der jodometrischen Aldosebestimmung bei der Analyse eines kohlenhydrathaltigen Gemisches. (Zeitschrift für Untersuchung der Nahrungs- und Genussmittel, Berlin, 1923, Bd. 45, p. 141-147.)

VTA

Dextrin is included in the scheme for determination of carbohydrates in potato sirup.

1514. Lindet, Léon, and P. Nottin. Estimation des féculs d'après le poids de leurs grains. (Annales des falsifications et des fraudes, Paris, 1923, année 16, p. 134-137.)

VTD

Give formula for calculating volume and weight of starch granules from a measurement of their diameters. A method for grading starches is suggested, in which about 200 granules are measured and averaged and the results expressed as weight per million granules.

Abstract in *Chem. abst.*, 1923, v. 17, p. 2517; *Jour. soc. chem. ind.*, 1923, v. 42, p. 672A; *Chem. Zentr.*, 1923, Bd. 4, p. 465; *Chimie et industrie*, 1924, v. 11, p. 666.

1515. Sabalitschka, Th., and H. Riesen-berg. Über die Ernährung von Pflanzen mit Aldehyden. III. Stört noch vorhandener

arches and Dextrins, continued.

ethods of Determination, continued.

ormaldehyd die Bestimmung von Zucker
d Stärke nach Sabalitschka in den mit
ormaldehyd behandelten Pflanzen? (Bio-
emische Zeitschrift, Berlin, 1924, Bd. 144,
551-555.) **PPB**

Do not believe that the formaldehyde

is an interfering factor in the determination
of starch by method of Sabalitschka.

1516. Sprockhoff. Bestimmung der tech-
nisch gewinnbaren Stärke im Schlamm mit-
tels der Laboratoriumsflute. (Zeitschrift
für Spiritusindustrie, Berlin, 1924, Jahrg.
47, p. 160-161.) **†† VTZA**

Abstract in *Chem. Zentr.*, 1924, Bd. 2, p. 896.

POLARIMETRIC METHODS OF DETERMINATION

17. Wiley, Harvey W. The estimation
dextrose, maltose, and dextrine in amy-
se (starch sugar). (Chemical news, Lon-
on, 1882, v. 46, p. 175-177.) **PKA**

The total reducing power and optical ac-
ity is determined, the sugars are ren-
dered optically inactive by treatment with
g(CN)₂ and the rotation of the remaining
extrin is determined. From the data ob-
ained the percentage of the 3 substances
ay be calculated.

Abstract in *Bull. soc. chim. Paris*, 1883, nouv.
e, tome 39, semestre 1, p. 251; *Wag. Jahr.*, 1882,
rg. 28, p. 692-694.

18. Baudry, A. Eine neue Art, schnell
d einfach den Stärkegehalt von Kartoff-
n und Handelstärke zu bestimmen. (Aus-
g.) (Zeitschrift für Spiritusindustrie, Ber-
n, 1892, N. F., Jahrg. 15, p. 41-42.)

Available in Library of the Patent Office.
The sample is finely ground, refluxed
h benzoic or salicylic acid, filtered and
the filtrate examined in the polariscope.
rections are given so that the starch
tent may be read directly from the po-
scope.

Also abstracted in *Wag. Jahr.*, 1892, Jahrg. 38, p.
Chem. Centr., 1892, Bd. 1, p. 339, 509.

9. — Eine neue Methode zur schnel-
und einfachen Bestimmung des Stärke-
hls in den Kartoffeln und in der Han-
stärke. (Abgekürzt.) (Dingler's poly-
misches Journal, Stuttgart, 1892, Bd.
p. 238-239.) **3-VA**

Abstract in *Chem. Centr.*, 1892, Bd. 2, p. 639.

10. Deltour. Stärkebestimmung nach
dry. (Auszug.) (Chemisches Central-
t, Hamburg and Leipzig, 1893, Bd. 1,
90.) **PKA**

The sample is heated on a sand bath with
te salicylic acid for 40-50 minutes, am-
ia added, and the solution polarized.

Also abstracted in *Wag. Jahr.*, 1893, Jahrg. 39,
2.

11. Effront, Jean. Estimation of starch
ereals. (Abstract.) (Society of Chemical
stry, Journal, London, 1896, v. 15, p.

† VOA

The sample is triturated with concen-
d HCl, the solution diluted with water,

filtered, neutralized, concentrated on water
bath and polarized. A small amount of glu-
cose is formed which is allowed for after
titrating with Fehling's solution.

Also abstracted in *Jour. chem. soc.*, 1898, v. 74,
part 2, p. 195; *Chem. Centr.*, 1897, Bd. 1, p. 202-
203.

1522. Weller, Heinrich. Die Zusammen-
setzung der Wurstwaren des Handels.
(Forschungs-Berichte über Lebensmittel,
München, 1896, Jahrg. 3, p. 430-432.)

Available in Library of the Department
of Agriculture.

Starch is dissolved by heating with very
dilute solutions of zinc chloride and HCl.
After the separation it is determined by
polarization or by weighing after precipita-
tion with absolute alcohol.

Abstract in *Jour. soc. chem. ind.*, 1898, v. 17, p.
499.

1523. Dowzard, Edwin. A quick polari-
metric method for the estimation of starch
in flour. (Chemical news, London, 1898, v.
77, p. 107-108.) **PKA**

Abstract in *Chem. Centr.*, 1898, Bd. 1, p. 906.

1524. Crispo, D. Nouveau procédé de
dosage rapide de l'amidon. (Annales de
chimie analytique, Paris, 1899, tome 4, p.
289-290.) **PKA**

The sample is boiled with dilute KOH
and the solution examined in the polari-
meter.

Reprinted in *Bull. assoc. chimistes*, 1899-1900,
tome 17, p. 321-322.

Abstract in *Jour. soc. chem. ind.*, 1900, v. 19, p.
76; *Jour. chem. soc.*, 1900, v. 78, part 2, p. 176;
Chem. Centr., 1899, Bd. 2, p. 851.

1525. — Dosage de la fécule dans les
levures. (Annales de chimie analytique,
Paris, 1899, v. 4, p. 290-291.) **PKA**

Application of the above method to the
determination of starch in yeast. An allow-
ance of 11% is made for the starch lost in
washing.

Reprinted in *Bull. assoc. chimistes*, 1899-1900,
tome 17, p. 322-324.

Abstract in *Jour. soc. chem. ind.*, 1900, v. 19, p.
77; *Jour. chem. soc.*, 1900, v. 78, part 2, p. 176;
Chem. Centr., 1899, Bd. 2, p. 852.

1526. Welms, P. Nachweis von Tra-
ganth und Dextrin in Cocoa und Choco-

*Starches and Dextrins, continued.**Polarimetric Methods of Determination, continued.*

laden und annähernde Bestimmung des Dextrins durch Polarisation. (Zeitschrift für öffentliche Chemie, Plauen, 1900, Jahrg. 6, p. 478-483.) **PKA**

Utilizes the fact that dextrins are precipitated quantitatively by lead acetate, in the presence of ammonia.

Abstract in *Jour. chem. soc.*, 1901, v. 80, part 2, p. 288; *Jour. soc. chem. ind.*, 1901, v. 20, p. 288; *Chem. Centr.*, 1901, Bd. 1, p. 65.

1527. Lindet, Léon. Sur un procédé d'analyse permettant de doser la dextrose et la dextrine dans les glucoses commerciaux. (Société chimique de Paris, Bulletin, 1901, série 3, tome 25, p. 91-93.) **PKA**

Total carbohydrates in the sample are determined by combustion analysis and the ratio of dextrose to dextrin by determining the specific rotation.

Reprinted in *Bull. assoc. chimistes*, 1900-01, tome 18, p. 294-296.

Abstract in *Chem. Centr.*, 1901, Bd. 1, p. 423.

1528. Crispo, D. Dosage de la fécule dans les produits de la charcuterie. (Annales de chimie analytique, Paris, 1902, tome 7, p. 441-442.) **PKA**

Abstract in *Chem. Centr.*, 1903, Bd. 1, p. 257.

1529. Ewers, Erich. Ein neuer Versuch zur polarimetrischen Bestimmung der Stärke. (Zeitschrift für öffentliche Chemie, Plauen, 1905, Jahrg. 11, p. 407-415.) **VOA**

Starch is dissolved by successive treatment with glacial acetic acid, hydrochloric acid and hot water, and the solution examined in the polarimeter; the rotation due to soluble carbohydrates is subtracted. Potassium ferrocyanide is used to clear the solution. Method is best suited to estimation of starch in commercial starches and flours.

Abstract in *Jour. chem. soc.*, 1906, v. 90, part 2, p. 57; *Chem. Zentr.*, 1906, Bd. 1, p. 91-92.

1530. Pellet, L., and MÉTILLON. Le dosage de la fécule dans la pomme de terre. A. Dosage exact. B. Dosage rapide de fécule extractible industriellement. (Association des chimistes de sucrerie et de distillerie, Bulletin, Paris, 1906-07, tome 24, p. 1720-1730.) **VOA**

A modification of Baudry's method. The sample is ground in a Sans-Pareille press, such disintegration eliminating the necessity of adding zinc chloride to facilitate solution. The pulp is dissolved by heating with salicylic acid and the solution polarized. Give another method, in which the sample is pulped as before, the starch passed through a metallic sieve (4000-5000 mesh per sq. cm.) and weighed along with water in a pycnometer. Give diagram.

Abstract in *Annales de chimie analytique*, 1908, tome 13, p. 9-12 (diagram); *Jour. soc. chem. ind.*,

1907, v. 26, p. 979 (diagram); *Chem. abst.*, 1908, v. 2, p. 1844; *Chem. Zentr.*, 1908, Bd. 1, p. 893.

1531. Lintner, Carl J. Über die Bestimmung des Stärkegehaltes der Gerste durch Polarisation. (Zeitschrift für das gesamte Brauwesen, München, 1907, Jahrg. 30, p. 109-111.) **VTRA**

The sample is triturated with water and concentrated HCl added. The solution is allowed to stand 30 minutes, is washed into a volumetric flask, 5 c.c. of a solution of phosphotungstic acid added, the volume made up with dilute HCl and the rotation determined after filtering. Barley starch in HCl solution has a rotation of $\alpha_D=200.3^\circ$.

Abstract in *Jour. soc. chem. ind.*, 1907, v. 26, p. 281; *Chem. abst.*, 1907, v. 1, p. 2740; *Jour. chem. soc.*, 1907, v. 92, part 2, p. 823; *Chem. Centr.*, 1907, Bd. 1, p. 1078; *ibid.*, Bd. 2, p. 1272.

1532. Wenglein, O. Über die Beziehungen zwischen dem durch Polarisation erhaltenen Stärkewert und dem Eiweiss- und Extraktgehalt der Gerste. (Zeitschrift für das gesamte Brauwesen, München, 1907, Jahrg. 30, p. 157-160.) **VTRA**

Abstract in *Chem. abst.*, 1909, v. 3, p. 939; *Chem. Centr.*, 1907, Bd. 1, p. 1357; *Bull. assoc. chimistes*, 1907-08, tome 25, p. 581.

1533. Ewers, Erich. Über Bestimmung des Stärkegehaltes auf polarimetrischen Wege. (Zeitschrift für öffentliche Chemie, Plauen, 1908, Jahrg. 14, p. 8-19.) **VOA**

A method similar to that of Lintner's except that allowance is made for the optical activity of other substances present. Thirteen tables are given.

Condensed in *Zeitschrift für Spiritusindustrie*, Berlin, 1908, Jahrg. 31, p. 166.

Abstract in *Jour. soc. chem. ind.*, 1908, v. 27, p. 238; *Chem. abst.*, 1908, v. 2, p. 1844; *Chem. Zentr.*, 1908, Bd. 1, p. 556.

1534. — Über die Bestimmung des Stärkegehalts auf polarimetrischem Wege. (Zeitschrift für öffentliche Chemie, Plauen, 1908, Jahrg. 14, p. 150-157.) **VOA**

Gives details and results obtained with a number of starches.

Condensed in *Bull. assoc. chimistes*, 1908-09, tome 26, p. 386-388; *Zeitschrift für Spiritusindustrie*, Berlin, 1908, Jahrg. 31, p. 265-267.

Abstract in *Chem. abst.*, 1908, v. 2, p. 2881; *Chem. Zentr.*, 1908, Bd. 1, p. 2061.

1535. Lintner, Carl J. Über polarimetrische Stärkebestimmung. (Zeitschrift für Untersuchung der Nahrungs- und Genussmittel, Berlin, 1908, Bd. 16, p. 509-512.)

Available in Library of the Chemists' Club.

The method described in entry 1531 is modified by substituting the use of H_2SO_4 for HCl. Gives details.

Abstract in *Jour. chem. soc.*, 1908, v. 94, part 2, p. 1077; *Chem. abst.*, 1909, v. 3, p. 845; *Chem. Centr.*, 1909, Bd. 1, p. 48.

ches and Dextrins, continued.

rimetric Methods of Determination, continued.

5. Telle. Dosage rapide de l'amidon des saucissons, saucisses, cervelas et des produits de la charcuterie. (Annales chimie analytique, Paris, 1908, tome 13, 44-146.)

PKA

Starch in the sample is dissolved by reagent with dilute citric acid or by heating in autoclave at 120°, the mixture filtered and the filtrate examined in the polariscope. The rotatory power of soluble starch is given as $\alpha_D=194.8^\circ$.

Abstract in *Chem. abst.*, 1908, v. 2, p. 2270; *Chem. Zentr.*, 1908, Bd. 1, p. 1907.

7. Wenglein, O. Zur Bestimmung des Stärkegehaltes in Gersten durch Polarisation. (Zeitschrift für das gesammte Brauwesen, München, 1908, Jahrg. 31, p. 53-56.)

† VTRA

Modifies the polarimetric method of Lintner by substituting sulphuric acid for the hydrochloric acid prescribed; the substitution eliminates the objectional vapors caused by the concentrated HCl. For barley starch in strong sulphuric acid, $\alpha_D=7^\circ$.

Abstract in *Jour. soc. chem. ind.*, 1908, v. 27, p. 1320; *Chem. abst.*, 1908, v. 2, p. 1320; *Chem. Zentr.*, Bd. 1, p. 1094; *Bull. assoc. chimistes*, 1907-08, 25, p. 988.

8. Buisson, M. Dosage de l'amidon. International Congress of Applied Chemistry, 7th, London, 1909, [Proceedings], section 6a, p. 15-18.)

PKR

Modifying method of Baudry, heats sample with aqueous solution of picric acid in a CaCl_2 bath for 45 minutes, dilutes, filters and examines in the polarimeter. Clear solutions are obtained; 22 determinations by the two methods give concordant results.

Print in *Bull. assoc. chimistes*, 1908-09, tome 26, 10-983.

Abstract in *Jour. soc. chem. ind.*, 1909, v. 28, p. 1320; *Chem. Zentr.*, 1909, Bd. 2, p. 754.

9. Thorne, L. T., and E. H. JEFFERS. Method on the hydrochloric acid extraction method for the polarimetric estimation of starch. (Abstract.) (International Congress of Applied Chemistry, 7th, London, 1909, section 6-A, p. 14-15.)

PKR

Modifies method of Lintner; by regulating the HCl concentration, the danger of hydrolysis or precipitation is obviated. Print in *Chem. abst.*, 1910, v. 4, p. 1697; *Jour. soc. chem. ind.*, 1909, v. 28, p. 731; *Zeit. ang. Chem.*, Jahrg. 22, p. 1247.

10. Ewers, Erich. Ueber polarimetrische Stärkebestimmung. (Zeitschrift für

öffentliche Chemie, Plauen, 1910, Jahrg. 15, p. 8-14.)

VOA

The starch is dissolved by heating with 1% HCl on a boiling water bath for 15 minutes.

Abstract in *Chem. abst.*, 1909, v. 3, p. 1826; *Chem. Zentr.*, 1909, Bd. 1, p. 691.

1541. Greifenhagen, W., and others. Bestimmung der Stärke. Von W. Greifenhagen, J. König und A. Scholl. (Biochemische Zeitschrift, Berlin, 1911, Bd. 35, p. 194-216.)

PPB

Have investigated and found satisfactory the polarimetric methods of Ewers and Lintner as applied to a large number of feedstuffs and starchy materials, particularly cinnamon, cocoa and pepper. The presence of cellulose, hemicellulose and pentosans does not affect the results.

Abstract in *Jour. chem. soc.*, 1911, v. 100, part 2, p. 1037; *Jour. soc. chem. ind.*, 1911, v. 30, p. 1181; *Chem. abst.*, 1912, v. 6, p. 1016; *Chem. Zentr.*, 1911, Bd. 2, p. 1270; *Bull. assoc. chimistes*, 1911-12, tome 29, p. 382; *Bull. soc. chim. France*, 1912, série 4, tome 12, p. 638.

1542. Lintner, Carl J. Die Bewertung der Gerste im Hinblick auf die zu erwartende Extraktausbeute aus dem Malze. (Zeitschrift für das gesammte Brauwesen, München, 1911, Jahrg. 34, p. 301-308.)

† VTRA

Determination of starch by polarimetric methods is recommended as a method of barley valuation.

Also in *Zeit. ang. Chem.*, 1911, Jahrg. 24, p. 1561-1564.

Abstract in *Jour. soc. chem. ind.*, 1911, v. 30, p. 1080.

1543. Vollant, André F. Dosage du saccharose et recherche de la dextrose dans quelques produits alimentaires. (Annales des falsifications, Paris, 1911, année 4, p. 504-509.)

VTD

Proteins and gums are removed, the sucrose present is inverted, and its optical activity, along with that of other sugars, destroyed by alkaline hydrogen peroxide; any optical activity in the resulting solution is due solely to dextrins.

Abstract in *Jour. soc. chem. ind.*, 1911, v. 30, p. 1329; *Chem. abst.*, 1912, v. 6, p. 1189; *Jour. chem. soc.*, 1912, v. 102, part 2, p. 101; *Chem. Zentr.*, 1911, Bd. 2, p. 1885.

1544. Baumert, G. Polarimetrische Bestimmung der Bananenstärke. (Zeitschrift für Untersuchung der Nahrungs- und Genussmittel, Berlin, 1912, Bd. 24, p. 449-452.)

VTA

Starch in two samples is determined by the method of Ewers and of Lintner. Under the conditions given the specific rotations are respectively 196.4° and 209.8°.

Abstract in *Jour. soc. chem. ind.*, 1912, v. 31, p. 1047.

Starches and Dextrins, continued.

Polarimetric Methods of Determination, continued.

1545. Ernest, A. Nouvelle méthode pour la détermination de l'amidon dans l'orge. (Association des chimistes, Bulletin, Paris, 1912-13, tome 30, p. 427-428.) **VOA**

A polarimetric method.

1546. Herles, Franz. Polarimetrische Stärkebestimmung in Kartoffeln. (International Congress of Applied Chemistry, 8th, Washington and New York, 1912, Original communications, v. 26, p. 5-10.) **PKR**

The sample is treated with fuming HCl, diluted, filtered and polarized. Proportions are used so that the scale reading indicates the percent starch directly.

Abstract in *Chem. abst.*, 1913, v. 7, p. 3045; *Chem. Zentr.*, 1913, Bd. 2, p. 718.

1547. Lehmann, P., and E. SCHOWALTER. Polarimetrische Bestimmung von Stärke in Wursthwaren. (Zeitschrift für Untersuchung der Nahrungs- und Genussmittel, Berlin, 1912, Bd. 24, p. 319-327.) **VTA**

The sample is extracted with alcoholic KOH, the residue dissolved in aqueous NaOH, and the solution heated with dilute HCl, neutralized, clarified with Pb(OH)₂, filtered and polarized. A number of results are given.

Abstract in *Chem. abst.*, 1912, v. 6, p. 3473; *Chem. Zentr.*, 1912, Bd. 2, p. 1402.

1548. Lintner, Carl J. Über die polarimetrische Stärkebestimmung. (Zeitschrift für angewandte Chemie, Leipzig, 1912, Jahrg. 25, Teil 1, p. 1177.) **PKA**

Wenglein's modification may cause decomposition of starch, especially during warm weather; author modifies by using sulphuric acid of 1.4 instead of 1.7 specific gravity and maintaining reaction mixture at 22° for one hour.

Abstract in *Jour. soc. chem. ind.*, 1912, v. 31, p. 653; *Bull. assoc. chimistes*, 1912-13, tome 30, p. 407.

1549. Pieraerts, J. Dosage de la matière amylacée dans les produits commerciaux. (Association des chimistes, Bulletin, Paris, 1912-13, tome 30, p. 628-659.) **VOA**

Determines conditions which affect the dissolving of starch for polarimetric determinations. Using a number of organic acids the time of heating and the pressure are varied.

Abstract in *Chem. abst.*, 1914, v. 8, p. 2504; *Chem. Zentr.*, 1913, Bd. 2, p. 176.

1550. Porst, Christian E. G., and HARRY A. CROWN. Research on Lintner's polarimetric method for the determination of starch. (International Congress of Applied Chemistry, 8th, Washington and New York,

1912, Original communications, v. 13, p. 213-218.) **PKR**

Have determined effects of varying temperature and time of acid steeping, time of standing after addition of phosphotungstic acid, and concentration of phosphotungstic acid. Selecting those conditions which give most constant readings, have found the results agree closely with those of the diastase method. The specific rotatory power of dry corn starch was 199.413°.

Abstract in *Jour. soc. chem. ind.*, 1912, v. 31, p. 892; *Chem. abst.*, 1912, v. 6, p. 3034.

1551. — A polarimetric method for the determination of starch in paper. (International Congress of Applied Chemistry, 8th, Washington and New York, 1912, Original communications, v. 26, p. 13-16.) **PKR**

Determine starch in 3 samples by method prescribed in above article. Computations are based on a determination of the rotatory power of 1 gr. starch in 200 c.c. solution.

1552. Grimme, Clemens. Apparat zur Stärkebestimmung nach Ewers. (Zeitschrift für Untersuchung der Nahrungs- und Genussmittel, Berlin, 1913, Bd. 25, p. 726-727.) **VTA**

Describes a rack by means of which the solutions are suspended in boiling water. Illustration is given.

Abstract in *Chem. abst.*, 1913, v. 7, p. 3621.

1553. Mach. Polarimetrische Stärkebestimmungen in Roggen- und Weizenmahlabfällen. (Landwirtschaftliches Versuchstationen, Berlin, 1913, Bd. 81, p. 142-151.)

Available in Library of the Department of Agriculture.

Although the polarimetric method for starch determination has not been perfected so that it is an absolutely exact method, it can be used most profitably in the examination of rye and wheat millings when it is a question of ascertaining whether bran-rich meal has been substituted for feeding meal or semolina. — *Chem. abst.*

1554. Porst, Christian E. G., and HARRY A. CROWN. Polarimetric method for determination of starch in paper. (Journal of industrial and engineering chemistry, Easton, 1913, v. 5, p. 304.) **†VOA**

Supplementary to two preceding articles. Substitute paper pulp for phosphotungstic acid as clarifying agent. Obtain 15 values for specific rotation of pure corn starch in concentrations ranging from 0.1 gr. to 5 grs. in 200 c.c. solution.

Abstract in *Chem. Zentr.*, 1913, Bd. 1, p. 1939.

1555. Rigaud, M. Praktische Verwertung der polarimetrischen Stärkebestimmung der Gerste im Grossbetrieb. (Zeitschrift für das

hes and Dextrins, continued.

imetric Methods of Determination, continued.

unte Brauwesen, München, 1913, g. 36, p. 605-611.) †VTRA

e polarimetric method of Lintner and starch is recommended. Points out value arch determinations.

tract in *Chem. abst.*, 1914, v. 8, p. 1324.

Schwarz, E. Über die polarime-
e Stärkebestimmung in der Gerste.
schrift für das gesammte Brauwesen,
chen, 1913, Jahrg. 36, p. 85-88, 97-102.)

†VTRA
udies influence of temperature and
on the results.

tract in *Chem. Zentr.*, 1913, Bd. 1, p. 1307;
assoc. chimistes, 1912-13, tome 30, p. 661;
Jahr., 1913, Jahrg. 59, Abt. 2, p. 376.

Cappuyns, A. Stärkebestimmung im
(Zeitschrift für das gesammte Brau-
n, München and Berlin, 1914, Jahrg. 37,
5-456.) †VTRA

polarimetric method in which dilute
H is used for washing out the starch
er to prevent degradation by enzymes.
tract in *Chem. abst.*, 1915, v. 9, p. 119; *Chem.*
1914, Bd. 2, p. 1331.

Ewers, Erich. Über die Bestimmung
Stärkegehaltes in rohen Kartoffeln.
schrift für öffentliche Chemie, Plauen,
Jahrg. 21, p. 232-233.) VOA

ample is mixed with dilute HCl, heated
iling water bath for 15 minutes, clari-
with sodium molybdate, filtered and
zed.

tract in *Chem. abst.*, 1916, v. 10, p. 1558;
Zentr., 1915, Bd. 2, p. 759.

Grossfeld, J. Über die Wirkung der
annatklärung bei der polarimetrischen
suchung von Zucker-, Dextrin- und
elösungen. (Zeitschrift für Untersucher
Nahrungs- und Genussmittel, Ber-
15, Bd. 29, p. 51-56.) VTA

ng small quantities of tannin and lead
e as clarifying agent, finds the con-
tion of sugar and dextrin is not ap-
ably affected, whereas starch is ab-
l in the precipitate.

ract in *Chem. abst.*, 1915, v. 9, p. 1853; *Jour.*
m. ind., 1915, v. 34, p. 676; *Chem. Zentr.*,
id. 1, p. 638; *Zeit. ang. Chem.*, 1915, Jahrg.
123R.

Wieninger, F. M. Über eine polari-
che Stärkebestimmungsmethode in
rebern. (Zeitschrift für das gesamte
esen, München, 1915, Jahrg. 38, p.
0, 265-267, 273-274, 281-283, 289-291.)
lable in Library of the Chemists'

equal portions are digested with
tric acid; zinc sulphate added to the

first to precipitate 1-rotatory substances;
phosphotungstic acid added to the second
to precipitate the total starch along with the
1-rotatory substances, leaving the non-
amylaceous d-rotatory matters. The differ-
ence in rotation of the two solutions repre-
sents soluble starch.

Abstract in *Chem. abst.*, 1915, v. 9, p. 3323-3324;
Jour. soc. chem. ind., 1916, v. 35, p. 377; *Chem.*
Zentr., 1915, Bd. 2, p. 1028.

1561. Grossfeld, J. Zur Bestimmung der
Stärke in Wurstwaren. (Zeitschrift für Un-
tersuchung der Nahrungs- und Genuss-
mittel, Berlin, 1916, Bd. 31, p. 237-239.)

VTA
Details a modification of the Lehmann
and Schowalter method.

Abstract in *Chem. abst.*, 1917, v. 11, p. 2509;
Chem. Zentr., 1916, Bd. 2, p. 31.

1562. Baumann, C., and J. Grossfeld. Die
polarimetrische Bestimmung der Stärke bei
Gegenwart sonstiger optisch-aktiver Stoffe.
(Zeitschrift für Untersuchung der Nah-
rungs- und Genussmittel, Berlin, 1917, Bd.
33, p. 97-103.) VTA

Utilize the fact that starch is completely
precipitated by lead tannate formed in the
solution; from the diminution in rotation
resulting from the precipitation and re-
moval of the starch, the percentage of the
latter is calculated, the average value of the
specific rotation of various starches being
183.7°.

Abstract in *Chem. abst.*, 1917, v. 11, p. 2969;
Chem. Zentr., 1917, Bd. 1, p. 695.

1563. Hals, Sigmund, and Sverre Hegg-
HAUGEN. Über die polarimetrische Stärke-
bestimmung in Körnern und Müllereier-
zeugnissen. (Landwirtschaftlichen Ver-
suchs-Stationen, Berlin, 1917, Bd. 90, p. 391-
414.)

Available in Library of the Department
of Agriculture.

Give details of modification of Ewers
method as used in this work. Tabulate com-
parative results obtained by methods of
Lintner, Lintner-Belschner and of Ewers.

Abstract in *Chem. abst.*, 1918, v. 12, p. 1089;
Chem. Zentr., 1918, Bd. 1, p. 142; *Jour. soc. chem.*
ind., 1918, v. 37, p. 69A.

1564. Mannich, C., and Käthe Lenz. Über
eine Methode zur polarimetrischen Bestim-
mung der Stärke in Calciumchloridlösung.
(Zeitschrift für Untersuchung der Nah-
rungs- und Genussmittel, Berlin, 1920, Bd.
40, p. 1-11.) VTA

Make use of the solubility of starch in
concentrated calcium chloride solution; by
addition of a small proportion of acetic acid
they obtain a clear solution suitable for di-
rect polarimetric observation.

Abstract in *Chem. abst.*, 1920, v. 14, p. 3481;
Chem. Zentr., 1921, Bd. 2, p. 321.

Starches and Dextrins, continued.

Polarimetric Methods of Determination, continued.

1565. Grossfeld, J. Die Bestimmung der Stärke in Wurstwaren. (Zeitschrift für Untersuchung der Nahrungs- und Genussmittel, Berlin, 1921, Bd. 42, p. 29-31.) **VTa**

The previously described method (*entry 1561*) is modified by the use of a specially heated filter.

Abstract in *Chem. abst.*, 1922, v. 16, p. 1625; *Chem. Zentr.*, 1921, Bd. 4, p. 914; *Chimie et industrie*, 1922, v. 8, p. 802.

1566. Luehrig, H. Polarimetrische Stärkebestimmung. (Pharmazeutische Zentralhalle für Deutschland, Dresden and Leipzig, 1921, Jahrg. 62, p. 141-144.)

Available in Library of Columbia College of Pharmacy.

Ewer's method gives the most consistent results and is not appreciably influenced by variations in the concentration of the acid used; however, the period of heating, 15 minutes, must not be exceeded. The method of Mannich and Lenz in which the starch is dissolved in a calcium chloride solution acidified with acetic acid and boiled

15 minutes gives consistent results.—*Chem. abst.*

Abstract in *Chem. Zentr.*, 1921, Bd. 4, p. 48.

1567. Riechelmann. Zur Bestimmung der Stärke im Manihotmehl. (Zeitschrift für öffentliche Chemie, Plauen, 1921, Jahrg. 27, p. 5.) **PKA**

Under the experimental conditions of Ewer's method the specific rotation of manioc starch was $\alpha_D = 183.1^\circ$.

Abstract in *Chem. Zentr.*, 1921, Bd. 2, p. 752.

1568. Savini, G. Beitrag zu den Analysen der Schokolade. (Auszug.) (Chemisches Zentralblatt, Leipzig and Berlin, 1923, Bd. 4, p. 804-805.) **PKA**

Starch is estimated by Lintner's cold polarimetric method as modified by Weinglein. Finds 4.4-6.5% starch in 4 varieties of decorticated, roasted cocoa.

Abstract in *Chem. abst.*, 1924, v. 18, p. 132; *Jour. soc. chem. ind.*, 1923, v. 42, p. 995A.

1569. Sturm, W. Meelbepaling in worst. (Chemisch weekblad, Amsterdam, 1924, jaarg. 22, p. 389.) **† 3-VOA**

A modification of Grossfeld's polarization method.

SACCHARIMETRIC METHODS OF DETERMINATION

1570. Fehling, H. Die quantitative Bestimmung von Zucker und Stärkemehl mittelst Kupfervitriol. (Annalen der Chemie und Pharmacie, Liebig's, Heidelberg, 1849, Bd. 72, p. 106-113.) **PKA**

The glucose obtained from starch is determined by means of a solution of copper sulphate, potassium tartrate and alkali. 100 parts of sugar correspond to 90 of starch. Gives reasons as to the cause of the slightly divergent results obtained by Schwarz.

1571. Schwarz, H. Ueber die Bestimmung des Stärkemehls auf nassem Wege. (Annalen der Chemie und Pharmacie, Liebig's, Heidelberg, 1849, Bd. 70, p. 54-56.) **PKA**

The sample is hydrolyzed with dilute H_2SO_4 and the resulting glucose estimated by means of alkaline copper oxide solution.

Abstract in *Jahresber. Chem.*, 1849, p. 603.

1572. Dragendorff. Zur quantitativen Bestimmung der Stärke. (Pharmaceutische Zeitschrift für Russland, St. Petersburg, 1862, Jahrg. 1, p. 41-46.)

Available in Library of the Surgeon General's Office.

The sample is digested in 5-6% alcoholic KOH solution for 18-30 hours, the mixture filtered, the residue digested with dilute HCl or concentrated malt solution and the

loss in weight considered as starch. Starch may be found indirectly by determining the amount of sugars formed. Gives a number of results obtained with various plant materials.

Condensed in *Chem. news*, 1863, v. 7, p. 51-52; *Chem. Centr.*, 1862, p. 523-524; *Bull. soc. chim. Paris*, 1863, p. 186-187; *Wag. Jahr.*, 1862, Jahrg. 8, p. 406-408; *Jahresber. Chem.*, 1862, p. 631-632; *Chemisch-technisches Repertorium*, 1862, Teil 2, p. 85; *Ding. poly. Jour.*, 1864, Bd. 171, p. 468.

1573. Siegert, Theodor. Ueber die Bestimmung der Stärke und des Zuckers. (Landwirtschaftlichen Versuchs-Stationen, Chemnitz, 1865, Bd. 7, p. 62-66.)

Available in Library of the Department of Agriculture.

The starch is hydrolyzed by H_2SO_4 in two steps and the resulting sugar determined by means of alkaline copper oxide solution.

Abstract in *Jahresber. Chem.*, 1865, p. 743.

1574. Apparat zur Dextrinbestimmung in der Würze und dem Biere. (Bayerische Bierbrauer, München, 1873, Jahrg. 8, p. 65-70.)

Available in Library of the Department of Agriculture.

The liquid is acidified with H_2SO_4 , heated for 6 hours at 110-115° and the resulting sugars determined with Fehling's solution.

ches and Dextrins, continued.

harimetric Methods of Determination, continued.

r allowing for preexisting sugars the
rin is calculated, using the factor 0.9.

Abstract in *Polytechnisches Centralblatt*, Leipzig,
Jahrg. 27, 1873, p. 1055.

uplicate abstracts in *Chem. Centr.*, 1873, p. 783;
Jahr., 1873, Jahrg. 19, p. 622.

Sachsse, Robert. Ueber die Stärkel-
und über Stärkebestimmungen. (Ab-
dr.) (Chemisches Central-Blatt, Leip-
1877, p. 732-736.) **PKA**

uplicate summary in *Wag. Jahr.*, 1878, Jahrg.
757-761.

Abstract in *Jahresber. Chem.*, 1877, p. 898.

Frickhinger, Hermann. Beiträge zur
titativen Bestimmung von Stärkemehl
Fürsten. (Archiv der Pharmacie, Halle,
Bd. 215, p. 234-235.)

Available in Library of Columbia College
pharmacy.

ne starch is present as an adulteration.
ommends that the sample be digested
dilute H_2SO_4 until a filtered portion
s no precipitate with alcohol, the mix-
filtered, the filtrate neutralized and the
r determined by titration with Cu solu-

Abstract in *Jour. chem. soc.*, 1880, v. 38, p. 826.

Medicus, L., and E. Schwab. Quan-
ve Bestimmung des Stärkemehl in
sten. (Deutsche chemische Gesell-
ft, Berichte, Berlin, 1879, Jahrg. 12, p.
-1286.) **PKA**

Abstract in *Jahresber. Chem.*, 1879, p. 1082.

Delbrueck. Gibt die Bestimmung
Stärkegehalts der Körnerfrüchte durch
ersion mit Schwefelsäure zuverlässige
ltate? (Zeitschrift für Spiritusindustrie,
n, 1880, N. F., Jahrg. 3, p. 74-75.)

Available in Library of the Patent Office.

Siewert. Beiträge zur Kenntniss der
emehlgehaltsbestimmungen der Kar-
n. (Landwirtschaftlichen Versuchs-
en, Berlin, 1880, Bd. 24, p. 427-434.)
Available in Library of the Department
griculture.

e finely disintegrated sample is heated
dilute tartaric acid for 4 hours at 112-
the mixture filtered, an aliquot portion
e filtrate inverted with dilute H_2SO_4
ugar determined gravimetrically with
hg's solution.

Abstract in *Jour. chem. soc.*, 1880, v. 38, p. 513.

Salomon, F. Die analytische Be-
nung der Stärke. (Repertorium der

analytischen Chemie, Hamburg, 1881,
Jahrg. 1, p. 274-280.)

Available in Library of the Chemists'
Club.

Determines the dried substance, the ash,
the portion insoluble in dilute acids (cellu-
lose, nitrogenous substances) and finally
determines starch by conversion with dilute
HCl and estimation of the resulting sugars.

Abstract in *Jour. chem. soc.*, 1882, v. 42, p. 339;
Jahresber. Chem., 1881, p. 1212.

1581. Faulenbach, C. Zur Bestimmung der
Stärke und des Traubenzuckers in Nah-
rungsmitteln mittelst Fehling'scher Lö-
sung. (Zeitschrift für physiologische
Chemie, Hoppe-Seyler's, Strassburg, 1882-
83, Bd. 7, p. 510-522.) **PKA**

The sample is digested with a glycerol
extract of malt, the mixture filtered, a por-
tion of the filtrate inverted with HCl and
the dextrose determined with Fehling's so-
lution.

Abstract in *Jour. chem. soc.*, 1884, v. 46, p. 930;
Chem. Centr., 1883, p. 632; *Jahresber. Chem.*, 1883,
p. 1620-1621.

1582. Francke, G. Stärkebestimmung in
Körnerfrüchten. (Abgekürzt.) (Jahres-Be-
richt der chemischen Technologie, Wag-
ner's, Leipzig, 1882, Jahrg. 28, p. 873-875.)

VOA

Shows that direct inversion with HCl
gives high results due to hydrolysis of cellu-
lose. Recommends that the grain be heated
with water alone or with a very dilute
solution of oxalic acid and the cellulose
separated by filtration.

Also abstracted in *Central-Blatt für Agrikultur-
chemie*, Biedermann's, Leipzig, 1883, Jahrg. 12, p.
37-39.

1583. Amthor, Carl. Die Bestimmung von
Stärkemehl in Wurst. (Auszug.) (Zeit-
schrift für analytische Chemie, Wiesbaden,
1883, Jahrg. 22, p. 278.) **PKA**

1584. Bungener, H., and L. Fries. Über
die Bestimmung des Stärkegehaltes der
Gerste. (Zeitschrift für das gesammte
Brauwesen, München and Leipzig, 1883,
Jahrg. 4, p. 39.)

Available in Library of the Chemists'
Club.

Starch is dissolved by heating with water
at 135° or with 1% salicylic acid at 100°,
the mixture filtered, the filtrate inverted
with HCl and the resulting sugars deter-
mined.

Reprinted in *Amerikanische Bierbrauer*, New York,
1884, Jahrg. 17, p. 9-10.

Abstract in *Jahresber. Chem.*, 1883, p. 1621; *Wag.
Jahr.*, 1883, Jahrg. 29, p. 872; 1884, Jahrg. 30, p. 960.

1585. O'Sullivan, Cornelius. On the esti-
mation of starch. (Chemical Society of Lon-
don, Journal, 1884, v. 45, p. 1-10.) **PKA**

The sample is washed with ether, alcohol
and water in order to remove fat, sugars,

*Starches and Dextrins, continued.**Saccharimetric Methods of Determination, continued.*

and amylans, respectively. After washing the starch is gelatinized, digested with malt diastase, the mixture filtered and a portion of the filtrate examined for its reducing power, specific rotation and specific gravity. Gives results for a number of cereals and for pure starch.

Abstract in *Chem. Centr.*, 1884, p. 188; *Bull. soc. chim. Paris*, 1885, nouv. série, tome 43, semestre 1, p. 388; *Wag. Jahr.*, 1884, Jahrg. 30, p. 744; *Jahresber. Chem.*, 1884, p. 1653.

1586. Richard, L. Note sur le dosage de l'amidon dans le pain de gluten. (*Journal de pharmacie et de chimie*, Paris, 1884, série 5, tome 9, p. 27.)

Available in Library of Columbia University.

The finely powdered sample is washed thoroughly, the wash water, containing the starch, is evaporated to a small bulk, heated in a sealed tube with dilute H_2SO_4 at 105° and the starch calculated after a determination of the resulting glucose.

1587. Maercker, M. Zur Bestimmung des Stärkemehls in Körnerfrüchten und Kartoffeln. (*Chemiker-Zeitung*, Cöthen, 1885, Jahrg. 9, p. 319.) †† VOA

Starch is dissolved by diastase, heated 30 minutes, under pressure with dilute tartaric acid, filtered, inverted with HCl and the dextrose determined by Allihn's method.

Printed in further detail in *Wochenschrift für Brauerei*, Berlin, 1885, Jahrg. 2, p. 191-195.

Abstract in *Wag. Jahr.*, 1885, Jahrg. 31, p. 862-864; *Zeit. anal. Chem.*, 1885, Jahrg. 24, p. 617; *Chem. Centr.*, 1885, p. 395.

1588. Zipperer, Paul. Zur Bestimmung der Stärke in Körnerfrüchten, etc., mittels des Soxhletschen Dampftopfes. (*Repertorium der analytischen Chemie*, Hamburg and Leipzig, 1886, Jahrg. 6, p. 699-703.)

Available in Library of the Chemists' Club.

The error due to the presence of cellulose is avoided by water digestion at a temperature of 140° degrees. The mixture is filtered, heated with HCl and the resulting dextrose titrated with Fehling's solution.

Includes illustration of digester.

Abstract in *Jour. soc. chem. ind.*, 1887, v. 6, p. 52; *Wag. Jahr.*, 1887, Jahrg. 33, p. 863; *Jahresber. Chem.*, 1886, p. 1974.

1589. Effront, Jean. Nouvelle méthode pour doser l'amidon et différentes espèces de sucre. (*Société chimique de Paris, Bulletin*, Paris, 1887, nouv. série, tome 47, semestre 1, p. 5-14.) PKA

Sugars, when mixed with dextrin, may be completely destroyed by successive treat-

ments with NH_3 and NaClO. All dextrins produced by enzymic hydrolysis have the same rotatory power. Describes method for determination of starch based on these two facts. A modification of Dubrunfaut's method is recommended for the rapid determination of starch in crude farinaceous materials.

Abstract in *Jour. chem. soc.*, 1887, v. 52, p. 867.

1590. Jones, E. W. T. Examination of wort and starch. (*Analyst*, London, 1887, v. 12, p. 163-168.) PKA

The methods employed are essentially those described by O'Sullivan.

Abstract in *Jour. chem. soc.*, 1888, v. 54, p. 199; *Wag. Jahr.*, 1887, Jahrg. 33, p. 867-868.

1591. Reinke, Otto. Die Bestimmung der Stärke in den Rohmaterialien. (*Zeitschrift für Spiritusindustrie*, Berlin, 1887, N. F., Jahrg. 10, p. 117-118.)

Available in Library of the Patent Office.

For purposes of starch manufacture and brewing the starch was saccharified by diastase and the dextrose estimated. For purposes of the distillery the sample was heated under pressure with 1% lactic acid and the dextrose determined after the inversion.

Abstract in *Wag. Jahr.*, 1887, Jahrg. 33, p. 863-864.

1592. Trojanowsky, Piers. Ein Beitrag zur pharmacognostischen und chemischen Kenntnis des Cacaos. (*Archiv der Pharmazie*, Halle, 1887, Bd. 210, p. 30-37.)

Available in Library of Columbia College of Pharmacy.

In the determination of starch the sample is treated successively with petroleum-ether, 80% alcohol, 6% alcoholic KOH, alcohol and distilled water. The residue is then hydrolyzed with sulphuric acid and the resulting sugars determined. The quantity of starch in chocolate should not exceed 7%.

Abstract in *Jour. chem. soc.*, 1877, v. 32, p. 363; *Jahresber. Chem.*, 1877, p. 937; *Ding. poly. Jour.*, 1877, Bd. 223, p. 650.

1593. Belluci, G. Sulla formazione dell'amido nei granuli di chlorofilla. (*Stazioni sperimentali agrarie italiana*, Roma, 1888, v. 14, p. 77-85.)

Available in Library of the Department of Agriculture.

After extraction of the leaves with water, starch is determined by inversion of the residue with H_2SO_4 and estimation of the resulting dextrose.

1594. Chapmann. Die Wirkung der Säuren auf die Hefe. (*Auszug*.) (*Chemisches Cen-*

hes and Dextrins; continued.

arimetric Methods of Determination, continued.

Blatt, Hamburg and Leipzig, 1888, p.

PKA

estigates the process for estimation of h by acid hydrolysis.

o abstracted in *Jahresber. Chem.*, 1888, p. 2495.

Heinzelmann, G. Untersuchung von . (Auszug.) (*Zeitschrift für ange- te Chemie*, Berlin, 1889, p. 557-558.) Available in Library of the Chemists'

mpares relative starch values obtained the sample is treated with dilute acids pressure and with malt extract. The er methods give high results due to on of cellulose.

o abstracted in *Jahresber. Chem.*, 1889, p. 2518.

Marck, Van der. Estimation of dex- n narcotic extracts. (*Analyst*, London, v. 14, p. 116-118.)

PKA

ommends a method in which the dex- s precipitated with basic lead acetate, lead removed by H_2S , and the dextrin mined by titrating with Fehling's solu- before and after inversion with HCl.

tract in *Chem. Centr.*, 1889, Bd. 2, p. 202; *ber. Chem.*, 1889, p. 2492.

Hoenig, Max. Zur Bestimmung der aser und der Stärke. (*Chemiker-Zei- Cöthen*, 1890, Jahrg. 14, p. 868, 902-903.)

†VOA

e finely divided sample is heated with ine at 210° , the solution cooled, starch itated with alcohol and ether, red y HCl from the insoluble fibre, ind with HCl and the dextrose deter- with Fehling's solution. Gives re- btained with 4 cereals.

ract in *Jour. soc. chem. ind.*, 1890, v. 9, p. *Jour. chem. soc.*, 1891, v. 60, p. 865; *Chem.*, 1890, Bd. 2, p. 275; *Jahresber. Chem.*, 1890, -2517.

Reinke, Otto. Die zur Bestimmung ärkemehles in Vorschlag gebrachten icken Methoden. (*Zeitschrift für anal- en Chemie*, Wiesbaden, 1890, Jahrg. 472-475.)

PKA

its with diastase, filters and inverts ICI.

ract in *Jour. chem. soc.*, 1891, v. 60, p. 127.

Lintner, Carl J., and GEORG DÜLL. en Einfluss der sog. stickstofffreien itstoffe auf das Ergebniss der Stärke- mung in Cerealien. (*Zeitschrift für andte Chemie*, Berlin, 1891, Jahrg. 4, 1538.)

lable in Library of the Chemists'

ss factors which affect results ob- y the inversion method. The water

extract of cereals contains certain gums which yield galactose and xylose as hy- drolysis products. The correct factor for conversion of dextrose to starch is 0.94. Employment of the factor 0.9 approximately compensates for the error due to presen- ce of other reducing substances.

Abstract in *Chem. Centr.*, 1891, Bd. 2, p. 732; *Wag. Jahr.*, 1891, Jahrg. 37, p. 827-829.

1600. Guichard, Petrus. Dosage de l'ami- don et action des acides étendus sur la cellulose. (*Société chimique de Paris*, Bul- letin, Paris, 1892, série 3, tome 7, semestre 2, p. 554-560.)

PKA

Starch is dissolved by oxalic or tartaric acid solution, saccharified by nitric acid and the glucose determined by polarization; 0.9 is taken as glucose-starch conversion fac- tor.

Abstract in *Jour. chem. soc.*, 1893, v. 64, p. 249; *Chem. Centr.*, 1892, Bd. 1, p. 831; Bd. 2, p. 558.

1601. Raumer, Ed. von. Über den Gehalt reiner Pfeffersorten und Pfefferschalen an Cellulose (Holzfaser) und Stärke, sowie an wasserlöslichen Aschenbestandteilen (Al- kalien) und Phosphorsäure. (*Zeitschrift für angewandte Chemie*, Berlin, Jahrg. 6, 1893, p. 453-457.)

†VOA

In the determination of starch, the sample is treated with boiling water, digested with diastase at 65° , lead acetate added, the mix- ture filtered, $KHCO_3$ added to the filtrate and, after filtering off the precipitated lead salt, the filtrate is inverted with HCl. Six samples of black pepper were shown to contain 22-40% starch.

Abstract in *Chem. Centr.*, 1893, Bd. 2, p. 607.

1602. Munsche, Albert. Die Bestimmung der Stärke durch alkoholische Gärung. (*Zeitschrift für Spiritusindustrie*, Berlin, 1894, N. F., Jahrg. 17, p. 202-203, 209-210.)

Available in Library of the Patent Office.

Finds that in the presence of malt dia- stase, pure yeast will remove all traces of reducing starch products. Starch is treated successively with malt extract and yeast and the resulting alcohol and CO_2 deter- mined. The method is particularly adapted for determination of starch in raw materials for the brewery or distillery.

Also in *Wochenschrift für Brauerei*, Berlin, 1894, Jahrg. 9, p. 795-798, 821-824.

Abstract in *Jour. soc. chem. ind.*, 1894, v. 13, p. 985; *Jour. chem. soc.*, 1895, v. 68, part 2, p. 144; *Chem. Centr.*, 1894, Bd. 2, p. 220-221, 300-301; *Wag. Jahr.*, 1894, Jahrg. 40, p. 796-797.

1603. Schulze, E. Zur quantitativen Be- stimmung der Kohlenhydrate. (*Chemiker- Zeitung*, Cöthen, 1894, Jahrg. 18, p. 527-528.)

†VOA

Discusses determination of sucrose, lac- tose and starch by hydrolyzing with dilute mineral acids and estimating the resulting

*Starches and Dextrins, continued.**Saccharimetric Methods of Determination, continued.*

sugars by means of Fehling's solution. Has found that reversion products of the sugars are formed before the polysaccharide is completely hydrolyzed.

Abstract in *Chem. Centr.*, 1894, Bd. 1, p. 930.

1604. Hibbard, P. L. Quick estimation of starch. (*American Chemical Society, Journal*, Easton, 1895, v. 17, p. 64-68.) **PKA**

The powdered sample, mixed with water, is twice heated to boiling with malt extract, filtered, boiled with acid on a sand bath and the dextrose determined by Fehling's solution. Gives 13 comparative determinations of malt and direct acid method. Method is applicable to cattle foods and starch factory residues.

Abstract in *Jour. soc. chem. ind.*, 1895, v. 14, p. 515; *Chem. Centr.*, 1895, Bd. 1, p. 511; *Jour. chem. soc.*, 1895, v. 68, part 2, p. 426.

1605. Koenig, F. Josef. Die Notwendigkeit der Umgestaltung der jetzigen Futter- und Nahrungsmittel-Analyse. (*Landwirtschaftlichen Versuchs-Stationen*, Berlin, 1896, Bd. 48, p. 81-110.)

Available in Library of the Department of Agriculture.

When starch is estimated by first dissolving in superheated water and inverting with acid, the results are invariably high due to the presence of pentosans or hemicelluloses. Estimation of starch by the diastase method also gives high results. Recommends that the starch be dissolved by superheated water, the solution inverted, the resulting sugars fermented and the amount of CO₂ or alcohol determined.

Abstract in *Jour. chem. soc.*, 1897, v. 72, part 2, p. 165-166.

1606. Kebler, Lyman F., and CHARLES H. LAWALL. The presence of starch and strontium sulphate in opium and their influence on assaying. (*American journal of pharmacy*, Philadelphia, 1897, v. 69, p. 244-250.)

Available in Library of the New York Academy of Medicine.

The sample is extracted with water, heated with alcoholic KOH, filtered hot, the alcohol driven off and the solution inverted with HCl. Glucose is determined by Fehling's solution. Other carbohydrates will be calculated as apparent starch.

Abstract in *Jour. soc. chem. ind.*, 1898, v. 17, p. 77; *Jour. chem. soc.*, 1898, v. 74, part 2, p. 463.

1607. Krug, William H. A recalculation of Wein's table of starch equivalent to copper found, based on the factor 0.92. (*American Chemical Society, Journal*, Easton, 1897, v. 19, p. 452-454.) **PKA**

For 453 copper values gives corresponding value of starch or dextrin.

1608. Sherman, Henry C. The insoluble carbohydrates of wheat. (*American Chemical Society, Journal*, Easton, 1897, v. 19, p. 291-310.) **PKA**

Discussion, p. 310, 316.

The scheme of analysis includes the separation of dextrins by washing with water and the separation of starch by inversion with malt extract.

Abstract in *Jour. soc. chem. ind.*, 1897, v. 26, p. 690; *Chem. Centr.*, 1897, Bd. 1, p. 1019-1021.

1609. Stone, Winthrop E. Estimation of carbohydrates in food-stuffs. (*American Chemical Society, Journal*, Easton, 1897, v. 19, p. 183-197, 347-349.) **PKA**

Sugars are removed by boiling sample with alcohol. After stirring the sample with water and filtering, the residue is treated with malt extract to determine insoluble starch and the filtrate is treated with barium hydroxide to precipitate any soluble starch which may have been formed. Dextrins are present in this last filtrate and are determined by inversion and Fehling's solution.

Abstract in *Jour. soc. chem. ind.*, 1897, v. 16, p. 703; *Chem. Centr.*, 1897, Bd. 1, p. 951, 1077; *Bull. soc. chim. Paris*, 1897, série 3, tome 18, p. 937.

1610. Bruylants, G., and H. DRUYTS. Note sur un nouveau procédé de dosage de la fécule ou de l'amidon dans la levure. (*Association belge des chimistes, Bulletin*, Bruxelles, 1899, année 13, p. 20-26.) **PKA**

Discuss the determination of starch in yeast by microscopic examination, by hydrolysis to glucose, by indirect methods and by colorimetric methods. Give a new method in which the sample is treated with iodine; the yeast cells separated by passing through fine sieves and by decantation; and the starch subsequently hydrolyzed to glucose by HCl.

Abstract in *Jour. soc. chem. ind.*, 1899, v. 18, p. 525; *Jour. chem. soc.*, 1900, v. 78, part 2, p. 113; *Chem. Centr.*, 1899, Bd. 2, p. 154; *Wag. Jahr.*, 1899, Jahrg. 45, p. 819.

1611. Traphagen, F. W., and W. M. COBLEIGH. Some notes on the estimation of carbohydrates. (*American Chemical Society, Journal*, Easton, 1899, v. 21, p. 369-373.) **PKA**

The inverted carbohydrate is allowed to act on Fehling's solution in the ordinary way. The precipitated cuprous oxide is dissolved in a solution of ferrous sulphate and sulphuric acid and titrated with potassium permanganate. The value of the permanganate solution is previously determined by using a known weight of starch or sugar.

Abstract in *Jour. soc. chem. ind.*, 1899, v. 18, p. 613; *Jour. chem. soc.*, 1899, v. 76, part 2, p. 529.

1612. Petit, Paul. L'analyse des mouts de saccharification par le malt. (*Moniteur sci-*

hes and Dextrins, continued.

rimetric Methods of Determination, continued.

que, Paris, 1900, tome 56, p. 797-806.)

OA

termines dextrin and maltose in sac-

trated worts by diastase and by acid.

tract in *Jour. soc. chem. ind.*, 1901, v. 20, p.

Lindet, Léon. Sur le dosage de l'amidon dans les graines des céréales. (Société chimique de Paris, Bulletin, 1901, série 25, p. 1055-1057.)

PKA

modifies his earlier method by substituting a process of decantation for the filtration. Determines the starch by hydrolysis with sulphuric acid, and the resulting glucose and dextrin by Fehling's solution and distillation.

printed with minor additions in *Annales de chimie analytique*, 1902, tome 7, p. 41-43; *Bull. assoc. chim.*, 1901-02, tome 19, p. 495-497.

Abstract in *Jour. soc. chem. ind.*, 1902, v. 21, p. 292; *Jour. chem. soc.*, 1902, v. 82, part 2, p. 55, 292; *Chem. Centr.*, 1901, Bd. 2, p. 1322.

Sur le dosage de l'amidon. (Extrait.) Association des chimistes de sucrerie et de distillerie, Bulletin, Paris, 1902-03, tome 20, p. 153.)

VOA

A portion of the sample is heated with alcoholic KOH, filtered, the residue hydrolyzed with boiling dilute HCl and the reducing sugars determined by Allihn's method.

Lietz, O. Über Stärkebestimmungen. Pharmaceutische Gesellschaft, Berlin, 1902, Jahrg. 12, p. 153-154.

Available in Library of Columbia College Pharmacy.

Starch is removed by refluxing the sample with a 5% solution of KOH in 90% alcohol, and filtering while hot. The residue is extracted with HCl and dextrose determined by Allihn's method. Any cellulose present may be separated immediately by inversion by dissolving the starch in water and filtering.

Abstract in *Jour. soc. chem. ind.*, 1902, v. 21, p. 292; *Chem. Centr.*, 1902, Bd. 1, p. 1339.

Weiser, Stephan, and ARTHUR ZAITZ. Beiträge zur Methodik der Stärkebestimmung und zur Kenntnis der Verdaulichkeit der Kohlehydrate. 1. Bestimmung der Stärke bei Gegenwart von Pektin. (Archiv für die gesamte Physiologie des Menschen und der Tiere, Pflüger-Bonn, 1903, Bd. 93, p. 98-127.)

QCA

Starches, formed by the acid hydrolysis, determined by the phloroglucide method. Their reducing power subtracted from that of the dextrose. Gives tables showing

reducing power of arabinose and xylose. Digestion experiments on oxen, sheep, etc., showed that starch was almost completely assimilated.

Condensed in *Landwirtschaftlichen Versuchsstationen*, Berlin, 1903, Bd. 58, p. 219-231.

Abstract in *Jour. soc. chem. ind.*, 1903, v. 22, p. 321; *Jour. chem. soc.*, 1903, v. 84, part 2, p. 225; *Chem. Centr.*, 1903, Bd. 1, p. 254; 1903, Bd. 2, p. 70.

1617. Brown, Horace T., and J. H. MILLAR. Method for the rapid determination of starch in barley and malt. (Abstract.) (Society of Chemical Industry, Journal, London, 1904, v. 23, p. 137.)

VOA

Extract with boiling alcohol, heat at 57° for an hour with malt extract, filter, and determine the cupric reducing power. 84.4 parts of maltose correspond to 100 parts starch.

1618. Rapid estimation of starch in barley and malt. (Abstract.) (Chemical Society of London, Journal, 1904, v. 86, part 2, p. 451-452.)

PKA

1619. Parow, Edmund. Die Stärkebestimmung durch Hydrolyse mittels Salzsäure. (Zeitschrift für Spiritusindustrie, Berlin, 1904, N. F., Jahrg. 27, p. 171.)

†† **VTZA**

Compares results obtained from 5 samples using 3 methods, which are (1) determination of starch by difference; (2) determination by method of Sachsse and (3) determination by Rössing's modification of the method of Sachsse.

Abstract in *Bull. assoc. chimistes*, 1903-04, tome 21, p. 1256; *Wag. Jahr.*, 1904, Jahrg. 50, p. 226.

1620. Roessing, Adelbert. Zur Bestimmung der Stärke durch Hydrolyse mittels Salzsäure. (Zeitschrift für öffentliche Chemie, Plauen, 1904, Jahrg. 10, p. 61-64.)

VOA

Five varieties of starch are analyzed for water, ash, proteins, cellulose and fat, and the starch determined by difference. Samples are inverted with HCl and the glucose determined by Allihn's method. Using the factor 0.93 to convert dextrose into starch, the amount found agreed with that actually present.

Abstract in *Jour. chem. soc.*, 1904, v. 86, part 2, p. 298; *Jour. soc. chem. ind.*, 1904, v. 23, p. 563; *Chem. Centr.*, 1904, Bd. 1, p. 1177.

1621. Brown, Horace T. Über eine Methode zur schnellen Bestimmung von Stärke in Gerste und Malz. (Zeitschrift für das gesamte Brauwesen, München und Berlin, 1905, Jahrg. 28, p. 97-98.)

† **VTRA**

The sample is digested with malt extract to the "resting stage" and the maltose determined with Fehling's solution; 84.4 parts of maltose correspond to 100 of starch.

Abstract in *Chem. Centr.*, 1905, Bd. 1, p. 775.

*Starches and Dextrins, continued.**Saccharimetric Methods of Determination, continued.*

1622. Wolff, Jules. Sur le dosage du maltose ou du glucose en présence de l'empois d'amidon. (*Annales de chimie analytique*, Paris, 1905, tome 10, p. 193-195.) **PKA**

The starch is dissolved by heating with malt extract; the amount of maltose formed in this operation is determined by treating starch paste with an equal amount of malt extract under the same conditions.

Abstract in *Jour. chem. soc.*, 1905, v. 88, part 2, p. 487; *Chem. Centr.*, 1905, Bd. 1, p. 1743.

1623. Gschwendner, B. Stärkeabbau durch Osmose und Hydrolyse unter erhöhter Temperatur. (*Chemiker-Zeitung*, Cöthen, 1906, Jahrg. 30, p. 761-763.) **†† VOA**

The sample is heated with acidified brine on a calcium chloride bath for 1¼ hours, basic lead acetate added, the solution filtered, polarized and the dextrose calculated to starch by the factor 0.9. Using maize, results are obtained intermediate between the pressure and the diastase methods.

Abstract in *Jour. soc. chem. ind.*, 1906, v. 25, p. 870; *Chem. Centr.*, 1906, Bd. 2, p. 914; *Bull. soc. chim. France*, 1907, série 4, tome 2, p. 264.

1624. Robin, Lucien. Dosage du sucre réel, du sucre réducteur et de l'amidon dans les chocolats. (*Annales de chimie analytique*, Paris, 1906, tome 11, p. 171-175.) **PKA**

The sample is triturated with water, lead acetate added, the mixture filtered, starch in the residue hydrolyzed with dilute HCl and the resulting sugars estimated. Starch above 9.7% is considered as an adulteration.

Abstract in *Chem. Centr.*, 1906, Bd. 2, p. 168; *Jour. chem. soc.*, 1906, v. 90, part 2, p. 499.

1625. Parow, Edmund, and FR. NEUMANN. Beitrag zur Bestimmung der Stärkestoffe in Handelsstärken und stärkehaltigen Produkten. (*Zeitschrift für Spiritusindustrie*, Berlin, 1907, Jahrg. 30, p. 561-562.) **†† VTZA**

In calculating dextrose to starch, have found the factor 0.95 to be most reliable. Describe a modification of Gschwendner's method (*entry 1623*) in which the results are purely empirical, necessitating a factor by which the starch may be calculated.

Abstract in *Jour. soc. chem. ind.*, 1908, v. 27, p. 84; *Chem. abst.*, 1908, v. 2, p. 686; *Jour. chem. soc.*, 1908, v. 94, part 2, p. 543; *Chem. Centr.*, 1908, Bd. 1, p. 557; *Bull. assoc. chimistes*, 1907-08, tome 25, p. 781-783.

1626. Frank-Kamenetzky, A. Eine neue Methode der Stärkebestimmung in Getreidearten aus der Extraktaubeute. Die Stärkebestimmung im Mais. (*Chemiker-*

Zeitung, Cöthen, 1908, Jahrg. 32, p. 157-159, 175-176.) **†† VOA**

Discusses error in usual methods due to presence of pentosans. Describes method in which the sample is thoroughly ground, treated with boiling water, digested with Merck's diastase, the mixture filtered and the refractive index of the filtrate determined by means of the Zeiss immersion refractometer. Gives results for a number of samples.

Abstract in *Chem. abst.*, 1908, v. 2, p. 1319, 1729; *Chem. Centr.*, 1908, Bd. 1, p. 1332; *Bull. assoc. chimistes*, 1908-09, tome 26, p. 492; *Bull. soc. chim. France*, 1909, série 4, tome 6, p. 215.

1627. Perrier, G., and A. FOUCHET. Dosage de l'amidon dans les produits charcuterie. (*Bulletin des sciences pharmacologiques*, Paris, 1908, tome 15, p. 305-307.)

Available in Library of the Surgeon General's Office.

The sample is heated in an autoclave with 3% HCl for 40 minutes at 120°, the mixture filtered, HCl and phosphotungstic acid added to the filtrate, the precipitate removed and the dextrose determined with Fehling's solution.

Abstract in *Chem. abst.*, 1909, v. 3, p. 1896; *Chem. Centr.*, 1908, Bd. 2, p. 545.

1628. Dubois, W. L. Determination of starch in cocoa products. (United States.—Department of Agriculture, Bureau of Chemistry, Washington, 1909, Bulletin 122, p. 214-215.) **VPH**

Previous to the hydrolysis, fat and sugars are removed by successive extractions with light petroleum and water. In each extraction the sample is shaken with the solvent, the mixture centrifuged and the clear liquid drawn off.

Abstract in *Chem. abst.*, 1909, v. 3, p. 2719; *Jour. soc. chem. ind.*, 1909, v. 28, p. 1160.

1629. — Determination of starch in cocoa products. (United States.—Department of Agriculture, Bureau of Chemistry, Washington, 1909, Bulletin no. 132, p. 136-138.)

Available in Library of the Chemists' Club.

Heats sample with strong sulphuric acid for a very short time, nearly neutralizes with KOH, filters, and determines cupric reducing power.

Abstract in *Jour. soc. chem. ind.*, 1910, v. 29, p. 1207; *Chem. abst.*, 1910, v. 4, p. 2853.

1630. Ewers, Erich. Zur polarimetrischen Bestimmung der Stärke in der Gerste. (*Österreichisch-ungarische Zeitschrift für Zuckerindustrie und Landwirtschaft*, Wien, 1909, Jahrg. 38, p. 213-217.)

Available in Library of the Department of Agriculture.

Describes method in which hydrolysis is carried out so that reducing bodies such

ses and Dextrins, continued.

rimetric Methods of Determination, continued.

entosans and protein decomposition
acts are not calculated as glucose.

tract in *Chem. Zentr.*, 1909, Bd. 2, p. 755.

Schubert, Friedrich. Zur polarimet-
en Bestimmung der Stärke in der
e. (Österreichisch-ungarische Zeit-
ft für Zuckerindustrie und Landwirt-
t, Wien, 1909, Jahrg. 38, p. 218-220.)
ailable in Library of the Department
griculture.

fends his earlier article against criti-
of Ewers (*entry 1630*).

Ewers, Erich. Zur polarimetrischen
mmung der Stärke in der Gerste. (Ös-
chisch-ungarische Zeitschrift für
erindustrie und Landwirtschaft, Wien,
Jahrg. 38, p. 343-344.)

ailable in Library of the Department
griculture.

oly to Schubert (*entry 1631*). A final
by Schubert is appended.

Lalin, L. M. Über eine Methode zur
ebestimmung in Cerealien mittels des
uchrefraktometers von Zeiss. (Zeit-
t für das gesammte Brauwesen,
hen, 1909, Bd. 32, p. 231-233.) † **VTRA**
ymic conversion products of starch
equal refractive powers, measured by
ss immersion refractometer. To de-
ne starch in cereals, the sample is
ed with malt extract, filtered and the
on examined in the refractometer.
refraction of the soluble constituents
nd by following the same procedure
he omission of diastase.

inal in *Russian Physical Chemistry Society*,
St. Petersburg, 1909, tome 41, p. 472-476.

ract in *Jour. soc. chem. ind.*, 1909, v. 28, p.
hem. abst., 1910, v. 4, p. 839; *Chem. Zentr.*,
3d. 2, p. 151; *Bull. soc. chim. France*, 1910,
tome 8, p. 941.

Olson, George A. A rapid method
rolyzing starch. (*Journal of industrial
ngineering chemistry*, Easton, 1909,
445-447.) † **VOA**

finely ground sample is warmed with
paratively strong solution of H_2SO_4
minutes, the flask being rapidly ro-
during the operation; the resulting
se is determined in the usual manner.
s for a number of substances are
red with those obtained by the
e method. The diastase method
ower results than either of the above
ls.

act in *Chem. Zentr.*, 1910, Bd. 1, p. 60.

Rupp, E., and F. LEHMANN. Über
Lehmansche Titration von Zuck-

erarten. (*Archiv der Pharmazie*, Berlin,
1909, Bd. 247, p. 516-526.)

Available in Library of Columbia College
of Pharmacy.

Describe method for volumetric deter-
mination of the reduced CuO . The method
is applied to determination of starch and
dextrin.

Abstract in *Chem. Zentr.*, 1910, Bd. 1, p. 303.

1636. Schubert, Friedrich. Zersetzungs-
freie Verzuckerung der Stärke und ihre An-
wendung zur polarimetrischen Bestimmung
der Stärke in der Gerste. (Österreichisch-
ungarische Zeitschrift für Zuckerindustrie
und Landwirtschaft, Wien, 1909, Jahrg. 38,
p. 17-31.)

Available in Library of the Department
of Agriculture.

The sample is heated with acid brine for
5 hours on a boiling water bath and the
resulting solution polarized.

Abstract in *Jour. soc. chem. ind.*, 1909, v. 28, p.
487; *Chem. abst.*, 1910, v. 4, p. 2219; *Chem. Zentr.*,
1909, Bd. 1, p. 1608.

1637. — Methode zur Bestimmung der
Stärke in der Kartoffel. (Österreichisch-
ungarische Zeitschrift für Zuckerindustrie
und Landwirtschaft, Wien, 1911, Jahrg. 40,
p. 899-905.)

Available in Library of the Department
of Agriculture.

The finely ground sample is heated with
acid brine, filtered and polarized. Propor-
tions are used so that the reading may be
converted directly into percent starch.

Abstract in *Chem. abst.*, 1912, v. 6, p. 2018; *Chem.*
Zentr., 1912, Bd. 1, p. 686.

1638. Price, T. M. A method for deter-
mination of starch in meat food products.
(United States.—Department of Agricul-
ture: Bureau of Animal Industry, Circular
203, Washington, 1912. 6 p.) **VPO**

A combination of the methods of Mayr-
hofer, Bigelow and Perrier. The sample is
dissolved by boiling alcoholic KOH , the
starch precipitated by alcohol, filtered,
washed, hydrolyzed with sulphuric acid and
the dextrose determined by Fehling's solu-
tion. Uses 0.9 as conversion factor.

Abstract in *Chem. abst.*, 1913, v. 7, p. 2258; *Jour.*
soc. chem. ind., 1912, v. 31, p. 1196; *Chem. Zentr.*,
1913, Bd. 1, p. 193.

1639. Auguet, A. Dosage de l'amidon et
de la dextrine dans les dragées et produits
similaires. (*Annales des falsifications*, Paris,
1913, année 6, p. 143-147.) **VTD**

The sample is hydrolyzed by dilute HCl
in an autoclave at 110° , the reducing sugars
determined and after subtracting the
amount of sugars present before hydrolysis,

Starches and Dextrins, continued.

Saccharimetric Methods of Determination, continued.

the starch or dextrin is calculated by the factor 0.9.

Abstract in *Chem. abst.*, 1913, v. 7, p. 2070; *Chem. Zentr.*, 1913, Bd. 1, p. 1789.

1640. Perrier, G., and L. FARCY. Analyse des produits de charcuterie fabriqués dans l'Ille-et-Vilaine, les Côtes du Nord et la Mayenne. (*Annales des falsifications*, Paris, 1913, année 6, p. 89-94.) **VTD**

Give methods and results for a number of meat products. In determining starch, the sample is heated with dilute HCl at 120° in an autoclave, the mixture filtered, starch in the filtrate hydrolyzed with boiling HCl and the dextrose estimated by method of Bertrand.

Abstract in *Chem. Zentr.*, 1913, Bd. 1, p. 1299.

1641. Davis, William A., and ARTHUR J. DAISH. Methods of estimating carbohydrates. 2. The estimation of starch in plant material. The use of taka-diastase. (*Journal of agricultural science*, London, 1914, v. 6, p. 152-168.)

Available in Library of Columbia University.

The finely ground sample, previously treated to remove sugar and gums, is gelatinized and treated with taka-diastase. The sugars are determined by reduction methods and by the polariscope. No loss is occasioned by the use of clarifying agents as only maltose and dextrose are formed.

Reprinted in *Zeit. ang. Chem.*, 1914, Jahrg. 27, Teil 1, p. 116-119.

Abstract in *Jour. soc. chem. ind.*, 1914, v. 33, p. 657; *Jour. chem. soc.*, 1914, v. 106, part 2, p. 588.

1642. Muttelet, C. F. Dosage de la dextrine et des sucres dans les produits alimentaires. (*Annales des falsifications*, Paris, 1914, année 7, p. 372-380.) **VTD**

Abstract in *Chem. abst.*, 1915, v. 9, p. 488; *Chem. Zentr.*, 1914, Bd. 2, p. 952.

1643. Revis, Cecil, and H. R. BURNETT. The estimation of starch in cocoa by means of taká-diastase. (*Analyst*, London, 1915, v. 40, p. 429-432.) **PKA**

The sample is washed thoroughly with 10% alcohol, the residue suspended in boiling water for 15 minutes, cooled to 38°, taka-diastase added, the mixture held at 38° for 24 hours, the solution clarified by acid mercuric nitrate, and, after neutralization, the sugars estimated by combined polarimetric and Cu reduction methods.

Abstract in *Chem. abst.*, 1916, v. 10, p. 226; *Jour. chem. soc.*, 1915, v. 108, part 2, p. 845; *Jour. soc. chem. ind.*, 1915, v. 34, p. 1109; *Chem. Zentr.*, 1916, Bd. 1, p. 79.

1644. Bonifazi, G., and E. ROSENSTIEHL. Dosage de l'amidon dans les féculents. (*Mitteilungen aus dem Gebiete der Lebensmitteluntersuchung und Hygiene*, Bern, 1916, Bd. 7, p. 116-119.)

Available in Library of the Department of Agriculture.

Reflux the material (2-3 gr.) in a 400 c.c. flask with 150 c.c. water and 15 c.c. HCl of specific gravity 1.125 for 1-1.5 hours. Then cool rapidly, neutralize with NaOH, make up to 500 c.c. and determine the dextrose by Allihn's method. — *Chem. abst.*

Abstract in *Chem. Zentr.*, 1916, Bd. 1, p. 1271.

1645. Clark, Ernest D. Report on meat and fish. (Association of Official Agricultural Chemists, Journal, Washington, 1916-17, v. 2, p. 229-230.) **PKA**

Results obtained by 9 analysts, using the Price method, are in fair agreement. The method is recommended in place of Mayrhofer's.

1646. Challet, Elie. Dosage des matières amylacées dans les conserves de viande et les produits de charcuterie. (*Journal de pharmacie et de chimie*, Paris, 1917, série 7, tome 15, p. 325-328.)

Available in Library of the New York Academy of Medicine.

The sample is hydrolyzed by boiling for 1 hour in a solution of acid brine and the quantity of starch calculated from the Cu reducing power before and after hydrolysis. When glycogen and lactose are present, certain allowances must be made.

Abstract in *Jour. soc. chem. ind.*, 1917, v. 36, p. 1190; *Chem. abst.*, 1917, v. 11, p. 2937.

1647. Kamm, Oliver, and FRANK H. TENDICK. The estimation of starch in paper. 2. Analysis for dextrins in the presence of beater starch. (Paper, New York, 1919-20, v. 25, p. 460-461.) **VMPA**

Modified starch or dextrin may be determined by digesting with water at 60°, filtering by suction, hydrolyzing the filtrate by acid and determining the resulting sugar by Fehling's solution. The normal starch remaining in the paper is determined by extraction with dilute acetic acid as detailed in an earlier paper.

Abstract in *Jour. soc. chem. ind.*, 1920, v. 39, p. 102A.

1648. Voorhees, V., and OLIVER KAMM. The quantitative estimation of starch in paper. (Paper, New York, 1919, v. 24, p. 1091-1095.) **†† 3-VMA**

The paper is shredded, refluxed with dilute acetic acid for 1½ hours, filtered, the starch in the filtrate hydrolyzed with HCl, the solution neutralized and titrated into Fehling's solution. Control tests show the

ches and Dextrins, continued.

harimetric Methods of Determination, continued.

Method is sufficiently accurate in most cases.

Abstract in *Jour. soc. chem. ind.*, 1919, v. 38, p. 1002; *Chem. abst.*, 1919, v. 13, p. 2594.

Quisumbing, Francisco A. Determination of glucose and starch by the alkaline potassium permanganate method. (*Philippine Journal of Science*, Manila, 1920, v. 16, pp. 581-601.) **OA**

The starch sample is hydrolyzed by acid solution and boiled with alkaline permanganate under standardized conditions. The excess potassium permanganate is determined by oxalic acid and the dextrose found by difference to a table.

Abstract in *Chem. abst.*, 1921, v. 15, p. 644; *Chem. Zentr.*, 1923, Bd. 2, p. 1002; *Bull. soc. chim. France*, 1923, série 4, tome 30, p. 533.

Behre, A. Die Bestimmung von Glucose, Fructose, Saccharose und Dextrin zueinander. (*Zeitschrift für Untersuchung der Nahrungs- und Genussmittel*, Berlin, 1921, Bd. 41, p. 226-230.) **VTA**

Dextrose is determined by oxidation with ceric in alkaline solution. Method is applied to the determination of dextrose and sucrose in starch syrup, the increased amount of dextrose found after hydrolysis with HCl being a measure of the dextrin. The method is not determined effect of maltose on its results.

Abstract in *Jour. soc. chem. ind.*, 1921, v. 40, p. 1002; *Chem. Zentr.*, 1922, Bd. 4, p. 59; *Bull. assoc. chim. Ind.*, 1921-22, tome 39, p. 487; *Chimie et industrie*, 1922, v. 7, p. 258.

Behre, A., and others. Stärkesirup aus Kartoffeln und Mais. Von A. Behre, A. Düring und H. Ehrecke. (*Zeitschrift für Untersuchung der Nahrungs- und Genussmittel*, Berlin, 1921, Bd. 42, p. 246.) **VTA**

Dextrose and sucrose are calculated by determining reducing sugars before and after the Clerget inversion. Dextrins are calculated by comparing the latter figures with those obtained after the dextrins are hydrolyzed with boiling dilute HCl. Find reduction method shows an abnormally low sucrose content; most consistent results are obtained by the alkaline-iodometric method, which is described in detail. Difference was observed in the sugars in syrups from maize or potatoes.

Abstract in *Jour. soc. chem. ind.*, 1922, v. 41, p. 1002; *Chem. abst.*, 1922, v. 16, p. 1161; *Chem. Zentr.*, 1922, Bd. 2, p. 754.

Horton, Edward. The use of taka-diastase in estimating starch. (*Journal of*

agricultural science, London, 1921, v. 11, p. 240-257.)

Available in Library of Columbia University.

From a great deal of experimental work, concludes that determinations with taka-diastase (entry 1641), are not trustworthy unless a control test is carried out with each set of determinations. Finds results are affected by a variation in the quantity of enzyme, in the method of enzyme preparation, and in the clarifying agent selected.

Abstract in *Jour. chem. soc.*, 1921, v. 120, part 2, p. 661.

1653. Myers, Victor C., and **HILDA M. CROLL**. The determination of carbohydrates in vegetable foods. (*Journal of biological chemistry*, Baltimore, 1921, v. 46, p. 537-551.) **PPB**

The determination of starch is effected by hydrolyzing with taka-diastase, followed by gentle hydrolysis with HCl, the resulting sugars being determined by the colorimetric picrate method. A large number of determinations are recorded.

1654. Bouyer, J. Valeur des blés de la récolte de 1921. (*Annales des falsifications et des fraudes*, Paris, 1922, année 15, p. 332-337.) **VTD**

Gives 21 analyses which include starch determinations. Starch is determined by boiling with dilute H₂SO₄ and KHSO₄, neutralizing, clarifying and titrating with Causse-Bonnans solution.

Abstract in *Chem. abst.*, 1923, v. 17, p. 158.

1655. Coe, Mayne R., and **G. L. BIDWELL**. Estimation of starch and sugars by the use of picric acid. (*Association of Official Agricultural Chemists, Journal*, Washington, 1923-24, v. 7, p. 297-304.) **PKA**

Method depends on fact that solutions of sugars, when heated with picric acid and an alkali, give a coloration proportional to the amount of sugar. The sample is extracted with ether and alcohol, treated with boiling water, digested with malt solution, filtered, the filtrate hydrolyzed with dilute HCl and the resulting sugars determined colorimetrically.

Abstract in *Chem. abst.*, 1924, v. 18, p. 2973; *Chem. Zentr.*, 1924, Bd. 2, p. 1522.

1656. Coe, Mayne R. Report on method for the determination of starch in the presence of interfering polysaccharides. (*Association of Official Agricultural Chemists, Journal*, Washington, 1923-24, v. 7, p. 341-342.) **PKA**

Finds a variation in results obtained by different analysts when using the method of Walton and Coe.

Starches and Dextrins, continued.

Saccharimetric Methods of Determination, continued.

1657. Elsdon, G. D. Tables for sugar analysis. (Analyst, London, 1923, v. 48, p. 435-443.) **PKA**

The weights of various carbohydrates corresponding to every mg. of CuO from 120 to 460 mg. are given with the equivalent weights of Cu and of Cu₂O. The figures for starch have been obtained by multiplying those of dextrose by 0.900.

1658. Josephson, K. Vergleichende Versuche über verschiedene Bestimmungsmethoden für die bei der Stärkespaltung gebildete Maltose. (Deutsche chemische Gesellschaft, Berichte, Berlin, 1923, Jahrg. 56, p. 1758-1761.) **PKA**

Finds that the method of Bertrand is trustworthy and is not inferior to the hypiodate method of Wilstätter and Schudel.

Abstract in *Jour. chem. soc.*, 1923, v. 124, part 2, p. 662; *Chem. Zentr.*, 1923, Bd. 3, p. 976.

1659. Ling, Arthur R., and others. The estimation of starch. 1. The estimation of starch in barley and wheat. By A. R. Ling, E. H. Callow and W. J. Price. (Society of Chemical Industry, Journal, London, 1923, v. 42, p. 48-50T.) **††VOA**

Describe a method based on fact that the percentage of apparent maltose produced at the end of 1 hour by hydrolyzing starch with malt diastase bears a constant relation to the starch originally present.

Reprinted in further detail in *Institute of Brewing, Journal*, London, 1922, v. 28, p. 838-853, **VTRA**.

Condensed in *Chemical age*, 1922, v. 7, p. 790-791; *Chem. news*, 1922, v. 125, p. 346.

Abstract in *Chem. Zentr.*, 1923, Bd. 2, p. 926; Bd. 4, p. 295; *Chimie et industrie*, 1924, v. 11, p. 60; *Bull. soc. chim. France*, 1923, série 4, tome 34, p. 1144.

1660. Ling, Arthur R., and W. J. PRICE. Estimation of starch. 2. Estimation of starch in potatoes. (Institute of Brewing, Journal, London, 1923, v. 29, p. 732-734.) **VTRA**

The method previously described for wheat and barley, has now been extended to potatoes. The curve obtained with potato starch runs almost parallel with that for barley. Detail procedure followed.

Abstract in *Chem. abst.*, 1924, v. 18, p. 1061; *Jour. soc. chem. ind.*, 1923, v. 42, p. 1037A.

1661. Tempus, F. Quantitative determination of starch. (Abstract.) (Society of Chemical Industry, London, Journal, 1923, v. 42, p. 992A.) **†VOA**

The sample is heated with strong NH₃ solution, the mixture filtered and starch in the residue estimated by the diastase

method. The NH₃ treatment overcomes the difficulties usually attendant upon the determination of starch in vegetables.

Abstract in *Chem. abst.*, 1924, v. 18, p. 1062.

1662. Aerde, M. van. Das Vorkommen von Stärke in unseren Margarinen; ihre Bestimmung. (Auszug.) (Chemisches Zentralblatt, Leipzig and Berlin, 1923, Bd. 4, p. 890.) **PKA**

The sample is refluxed with dilute H₂SO₄, potassium ferrocyanide and zinc acetate solution added, the mixture filtered and the dextrose in the filtrate determined with Fehling's solution.

1663. Walton, George Pelham, and MAYNE R. COE. Determination of starch content in the presence of interfering polysaccharides. (Journal of agricultural research, Washington, 1923, v. 23, p. 995-1006.) **VPZ (U. S. Agriculture)**

The official methods of starch determination cannot be applied to linseed meal or cake due to the interfering presence of mucilage. The detailed method described consists of elimination of sugars by extraction with 35% alcohol, gelatinization with boiling water, digestion with malt diastase, coagulation and precipitation of the mucilage by 60% alcohol, hydrolysis of the starch conversion products by HCl and gravimetric determination of the resulting glucose. Give a number of results obtained with linseed and dried apple products.

Abstract in *Association of Official Agricultural Chemists, Journal*, 1923, v. 6, p. 350-354; *Jour. soc. chem. ind.*, 1923, v. 42, p. 417A; *Chem. Zentr.*, 1924, Bd. 2, p. 2798.

1664. Braun, M. Dosage de l'amidon dans les produits amylacés. (Annales de la science agronomique française et étrangère. Paris, 1924, tome 41, p. 352-358.) **VPA**

Abstract in *Chem. Zentr.*, 1925, Bd. 1, p. 2669.

1665. Chrzaszcz, Tadeusz. Die Bestimmung der Stärke nach der Malzmethode. (Zeitschrift für Untersuchung der Nahrungs- und Genussmittel, Berlin, 1924, Bd. 48, p. 306-311.) **VTA**

Abstract in *Chem. abst.*, 1925, v. 19, p. 802; *Chem. Zentr.*, 1925, Bd. 1, p. 776.

1666. Coe, Mayne R. Report on method for the determination of starch in the presence of interfering polysaccharides. (Association of Official Agricultural Chemists, Journal, Washington, 1924-25, v. 8, p. 358.) **PKA**

Details method for obtaining a sample free from lumps when the material is gelatinized.

Abstract in *Chem. abst.*, 1925, v. 19, p. 2381.

1667. Ling, Arthur R., and others. On the estimation of starch. The estimation of

ches and Dextrins, continued.

harimetric Methods of Determination, continued.

ch in barley and wheat. By A. R. Ling, Dinshaw R. Nanji and W. J. Harper. Institute of Brewing, Journal, London, 1924, v. 30, p. 838-845.)

VTRA

Method based on fact that amylose and amylopectin occur in an approximately constant ratio in all starches and that treatment of amylaceous materials with barley diastase at 50° does not affect hemicelluloses. Whereas amylose is converted to maltose, amylopectin converted to α -hexa-amylose. Determine maltose formed from the sample by action of precipitated barley diastase and, from a determination of maltose reduced under similar conditions from the potato starch, the amount of starch in the sample is calculated. For substances containing hemicelluloses, results are lower than those obtained by the malt diastase method.

Abstract in *Jour. soc. chem. ind.*, 1924, v. 43, p. 1281B; *Chem. Zentr.*, 1924, Bd. 2, p. 2802.

Thomas, Walter. Colorimetric determination of carbohydrates in plants by picric acid reduction method. II. The determination of starch and other "reserve" saccharides. (American Chemical Society, Journal, Easton, 1924, v. 46, p. 1670-1674.)

PKA

Colorimetric method for the determination of starch by means of conversion with diastase without a secondary hydrolysis is described. Under the conditions of

conversion, the ratio of glucose to maltose is approximately constant and the analytical error introduced by regarding this ratio as 2.0 is small, since the picrate-picric reducing ratio of glucose to maltose is relatively high.

Abstract in *Jour. soc. chem. ind.*, 1924, v. 43, p. 723B; *Chem. Zentr.*, 1924, Bd. 2, p. 1251.

1669. Wolff, Ottomar. Die Bestimmung der Stärke in technischen Stärkeprodukten und in Pflanzenteilen auf optischem Wege mit Hilfe des Interferometers. (*Zeitschrift für angewandte Chemie*, 1924, Jahrg. 37, p. 206-207.)

PKA

Starch in the sample is gelatinized by boiling water, hydrolyzed by diastase at 42°, and the mixture filtered. Diastase is also added to an equal weight of the same sample, but at a temperature too low for hydrolysis and the mixture filtered. The two clear solutions are compared in the interferometer. The instrument is previously calibrated by carrying out the operations with known quantities of pure starch.

Abstract in *Chem. abst.*, 1924, v. 18, p. 2821; *Chimie et industrie*, 1924, v. 12, p. 844.

1670. Lüers, H., and F. WIENINGER. Über die Bestimmung der Stärke in der Gerste. (*Zeitschrift für das gesamte Brauwesen*, Berlin, 1925, Jahrg. 48, p. 35-37.)

Available in Library of the Department of Agriculture.

The method of Ling, Nanji and Harper gives concordant results. A modification of the method was also used, in which the starch was saccharified in the presence of a yeast complement.

GRAVIMETRIC METHODS OF DETERMINATION

Wurster, C. Bestimmung des Harzes der Stärke im Papiere. (*Dingler's polytechnisches Journal*, Berlin, 1878, Bd. 229, p. 538-540.)

3-VA

Abstract in *Chem. Centr.*, 1878, p. 727.

Herman, E. Determination of starch in paper. (Abstract.) (*Society of Chemical Industry, Journal*, London, 1883, v. 2, p. 100.)

†VOA

The starch is obtained as an insoluble residue after dissolving a sample of the paper in 85% alcohol.

Schumann, G. Quantitative Bestimmung der Stärke im Papier. (*Papier Zeitung*, Berlin, 1887, Jahrg. 12, p. 389.)

VMA

The paper sample is heated with dilute alcohol, dried to constant weight, digested with malt extract, again dried, weighed and the loss in weight taken as starch.

Abstract in *Jour. soc. chem. ind.*, 1887, v. 6, p. 735; *Chem. Centr.*, 1887, p. 735.

1674. Burkhard, G. Nachweis und direkte Bestimmung der Stärke in dextrinhaltigen Flüssigkeiten. (*Chemiker-Zeitung*, Cöthen, 1887, Jahrg. 11, p. 1158.)

††VOA

The starch is precipitated by tannic acid.

Abstract in *Jour. soc. chem. ind.*, 1887, v. 6, p. 840; *Wag. Jahr.*, 1887, Jahrg. 33, p. 873-874; *Chem. Centr.*, 1887, p. 1327.

1675. Schumann, G. Quantitative Bestimmung der Stärke im Papier. (*Papier-Zeitung*, Berlin, 1887, Jahrg. 12, p. 982.)

Available in Library of the Department of Agriculture.

Abstract in *Chem. Centr.*, 1887, p. 1448.

1676. Leclerc, A. Recherche et dosage de l'amidon. (*Journal de pharmacie et de chimie*, Paris, 1890, série 5, tome 21, p. 641-645.)

Available in Library of Columbia College of Pharmacy.

The sample is treated with $ZnCl_2$ solution at 108° for 1 to 1½ hours, the dissolved

Starches and Dextrins, continued.

Gravimetric Methods of Determination, continued.

starch is precipitated with alcohol and the weight of the precipitate determined.

Abstract in *Jour. soc. chem. ind.*, 1890, v. 9, p. 976; *Jour. chem. soc.*, 1890, v. 58, p. 1197; *Chem. Centr.*, 1890, Bd. 2, p. 124; *Jahresber. Chem.*, 1890, p. 2515.

1677. Krieger, Josef. Methode zur quantitativen Bestimmung der Stärke. (Amerikanische Bierbrauer, New York, 1894, Jahrg. 27, p. 580-581.)

Available in Library of the Brewers' Academy.

Estimates starch by washing one sample free from water-soluble matter, drying and weighing. A duplicate sample is twice digested with malt extract, filtered, dried and weighed, and the difference in weight taken as starch.

Abstract in *Chem. Centr.*, 1895, Bd. 1, p. 1085.

1678. Filsinger, F. Stärkebestimmung in der Presshefe. (Chemiker-Zeitung, Cöthen, 1894, Jahrg. 18, p. 742.) †† VOA

The yeast is stirred with water and the starch present is stained by iodine solution. As the starch settles the supernatant liquid is siphoned off. After repeated decantation the starch is collected on filter paper, dried and weighed.

Abstract in *Jour. soc. chem. ind.*, 1894, v. 13, p. 908; *Jour. chem. soc.*, 1895, v. 68, part 2, p. 93; *Chem. Centr.*, 1894, Bd. 1, p. 1166.

1679. Mayrhofer, Joseph. Über die Bestimmung der Stärke in Fleischwaren. (Forschungs-Berichte über Lebensmittel, München, 1896, Jahrg. 3, p. 141-143.)

Available in Library of the Department of Agriculture.

Method based on fact that sugar, fat, albumin, etc., are dissolved by alcoholic KOH, whereas starch is insoluble. The sample is digested with alcoholic KOH, filtered, the residue dissolved in aqueous KOH, the solution acidified, the starch precipitated by addition of alcohol and thereupon dried and weighed.

Abstract in *Jour. chem. soc.*, 1897, v. 72, part 2, p. 525; *Chem. Centr.*, 1896, Bd. 2, p. 70.

1680. — Zur Bestimmung der Stärke in Wurstwaren. (Forschungs-Berichte über Lebensmittel, München, 1896, Jahrg. 3, p. 429-430.)

Available in Library of the Department of Agriculture.

The meat is dissolved in alcoholic KOH, diluted with alcohol, the mixture filtered, the residue dissolved in aqueous KOH, acidified, precipitated with alcohol, washed, dried and weighed.

Abstract in *Jour. chem. soc.*, 1898, v. 74, part 2, p. 195; *Chem. Centr.*, 1897, Bd. 1, p. 204.

1681. Lindet, Léon. Nouveau procédé de dosage de l'amidon dans les graines des céréales. (Société chimique de Paris, Bulletin, Paris, 1896, tome 15, p. 1163-1164.)

PKA

The grain, well bruised, is covered with a solution of 2% pepsin to destroy the gluten and 1.5% HCl to prevent the action of diastase. The mixture is enclosed in a piece of silk, kneaded, and the starch separated from the resulting liquids by filtration.

Reprinted in *Bull. assoc. chimistes*, 1896-97, tome 14, p. 405-406.

Abstract in *Jour. soc. chem. ind.*, 1896, v. 15, p. 923; *Jour. chem. soc.*, 1897, v. 72, part 2, p. 525; *Chem. Centr.*, 1897, Bd. 1, p. 268.

1682. — Sur le dosage de l'amidon dans les grains. (Moniteur scientifique du docteur Quesneville, Paris, 1899, tome 53, p. 115.)

OA

A reply to the criticism of Wiley and Krug (entry 1477) regarding his method of starch determination, which involved the use of pepsine hydrochloride (entry 1681). Gives further details and states that it is especially applicable to cereals containing large amounts of sugars.

Abstract in *Jour. soc. chem. ind.*, 1899, v. 18, p. 407.

1683. Baumert, Georg, and H. Bode. Zur Bestimmung des wahren Stärkegehaltes der Kartoffeln. Mit A. Fest. (Zeitschrift für angewandte Chemie, Berlin, 1900, Jahrg. 13, p. 1074-1078, 1111-1113.)

PKA

Discuss earlier methods of determination. Detail a new method in which the starch is rendered soluble by heating the sample under pressure. NaOH solution is added, the sodium starch precipitated with alcohol, the precipitate dissolved in HCl solution, reprecipitated with alcohol, dried on asbestos, weighed, the starch burnt off and the loss in weight calculated as starch.

Abstract in *Jour. chem. soc.*, 1901, v. 80, part 1, p. 44; *Jour. soc. chem. ind.*, 1900, v. 19, p. 1152; *Chem. Centr.*, 1900, Bd. 2, p. 1134; *Bull. assoc. chimistes*, 1900-01, tome 18, p. 699; *Wag. Jahr.*, 1900, Jahrg. 46, p. 291-292.

1684. Behrend, Paul, and H. Wolfs. Zur Bestimmung des wahren Stärkegehaltes der Kartoffeln nach der Methode von G. Baumert und H. Bode. (Zeitschrift für angewandte Chemie, Berlin, 1901, Jahrg. 14, p. 461-465.)

PKA

The authors have checked the method of Baumert and Bode and find it accurately represents the true starch content. Their own specific gravity method only affords comparative results.

Abstract in *Jour. soc. chem. ind.*, 1901, v. 20, p. 623; *Chem. Centr.*, 1901, Bd. 1, p. 1345.

1685. Lange, H. Bestimmung der Stärke in gemischten Presshefen. (Auszug.) (Zeit-

ches and Dextrins, continued.

Vimetric Methods of Determination, continued.

ift für Spiritusindustrie, Berlin, 1901, F., Jahrg. 24, p. 50.)

available in Library of the Patent Office.

shows the method of inverting with HCl applicable, because the yeasts contain reducing substances. Obtains fairly accurate results by the method of Kusw, in which the yeast is removed from starch by washing.

Abstract in *Jour. soc. chem. ind.*, 1901, v. 20, p.

Hebebrand, A. Ein neues Verfahren Bestimmung des Kartoffelmehls in e. (*Zeitschrift für Untersuchung der Nahrungs- und Genussmittel, Berlin, 1902, 5, p. 58-61.*)

available in Library of the Chemists'

odium carbonate solution which contains chlorine is very effective in separating starch from yeast cells. After separation starch is washed, dried and weighed.

Abstract in *Jour. soc. chem. ind.*, 1902, v. 21, p.

Gianturco, E. Dosage de l'amidon. Revue internationale des falsifications, 1902, année 15, p. 97-100.) † **VTD** method similar to that of Lindet. Finding of the starch from the suspension hastened by the precipitation of a calculated amount of aluminium hydroxide in the d.

Brooks, R. O. The rapid analysis of cream of tartar and tartaric acid bakers. (*American Chemical Society, Journal, Easton, 1904, v. 26, p. 813-818.*)

PKA

determines starch by digesting at ordinary temperature with dilute HCl, filtering, washing the precipitate, burning off the ash and reweighing.

Witte, H. Die gewichtsanalytische Stärkebestimmung von G. Baumert und H. angewandt auf Mehl und Handelsmehl. (*Zeitschrift für Untersuchung der Nahrungs- und Genussmittel, Berlin, 1904, 7, p. 65-77.*)

available in Library of the Chemists'

see details of method.

Abstract in *Bull. assoc. chimistes, 1903-04, tome 1170; Chem. Centr., 1904, Bd. 1, p. 837.*

Baur, Emil, and EDUARD POLENSKE. Ein Verfahren zur Trennung von Stärke und Glykogen. (*Arbeiten aus dem*

Kaiserlichen Gesundheitsamte, Berlin, 1906, Bd. 24, p. 576-580.)

Available in Library of the New York Academy of Medicine.

Soluble starch is separated from a solution of glycogen by precipitation with ammonium sulphate and the glycogen in the filtrate is precipitated with alcohol. The starch is washed with 50% alcohol, dried and weighed.

Abstract in *Jour. chem. soc.*, 1907, v. 92, part 2, p. 56; *Jour. soc. chem. ind.*, 1907, v. 26, p. 163; *Chem. Centr.*, 1906, Bd. 2, p. 1360.

1691-1692. Baumert, G. Zur gewichtsanalytischen direkten Stärkebestimmung nach dem Verfahren von G. Baumert und H. Bode. (*Zeitschrift für Untersuchung der Nahrungs- und Genussmittel, Berlin, 1909, Bd. 18, p. 167-168.*)

Available in Library of the Chemists' Club.

In dissolving the starch, treatment with concentrated HCl is substituted for the pressure method.

Abstract in *Jour. soc. chem. ind.*, 1909, v. 28, p. 949; *Chem. abst.*, 1910, v. 4, p. 62; *Chem. Zentr.*, 1909, Bd. 2, p. 935; *Zeitschrift für Spiritusindustrie, 1909, Jahrg. 32, p. 377; Bull. assoc. chimistes, 1909-10, tome 27, p. 791.*

1693. Piettre, Maurice. Séparation et dosage du glycogène et de l'amidon. Caractérisation de la viande de cheval dans les produits de la charcuterie. (International Congress of Applied Chemistry, 7th, London, 1909, [Proceedings], section 8C, p. 291-292.)

PKR

Fatty and protein matters are removed by refluxing with alcoholic KOH, the residue washed with hot 80% alcohol and dissolved by heating in slightly alkaline water. Using absolute alcohol the starch is precipitated immediately and the glycogen precipitated after concentration of the filtrate.

Also in *Annales de chimie analytique, Paris, 1909, tome 14, p. 206-207, PKA.*

Abstract in *Jour. chem. soc.*, 1909, v. 96, part 2, p. 706; *Chem. Zentr.*, 1909, Bd. 2, p. 562.

1694. Pozzi-Escot, Emm. Dosage de la dextre dans la bière. (*Association des chimistes de sucrerie et de distillerie, Bulletin, Paris, 1911-12, tome 29, p. 72-73.*)

VOA

The beer is concentrated by evaporation, the dextrin precipitated by alcohol and the precipitate separated by centrifuging. After dissolving in water and repeating the process, the dextrin is dried and weighed.

Abstract in *Jour. soc. chem. ind.*, 1911, v. 30, p. 1131.

1695. Examination of commercial starch. (Abstract.) (*Chemical abstracts, Easton, 1913, v. 7, p. 913.*)

PKA

*Starches and Dextrins; continued.**Gravimetric Methods of Determination, continued.*

1696. Goldbeck, C. Beitrag zur Beurteilung des Weizens und seiner Mahlprodukte als Rohstoff für die Stärkeindustrie. (Chemiker-Zeitung, Cöthen, 1915, Jahrg. 39, p. 689.) †† VOA

The meal is kneaded and washed with water, the gluten removed, the starch in the wash waters separated by centrifuging and both the gluten and starch are dried and weighed.

Abstract in *Jour. soc. chem. ind.*, 1915, v. 34, p. 1065; *Chem. abstr.*, 1915, v. 9, p. 3142.

1697. Huizinga, Alida. Die Stärkebestimmung nach der Methode von Baumert und Bode. (Auszug.) (Chemisches Zentralblatt, Berlin, 1916, Bd. 1, p. 1271.) PKA

Gives causes for variations in results.

Also abstracted in *Chem. abstr.*, 1916, v. 10, p. 1231.

1698. Babington, F. W., and others. The examination of commercial dextrin and related starch products. By F. W. Babington, Alfred Tingle and C. E. Watson. (Society of Chemical Industry, Journal, London, 1918, v. 37, p. 257-258T.) VOA

One gram of the sample is gelatinized in 30 c.c. water, the starch precipitated with $\text{Ba}(\text{OH})_2$ solution, an aliquot portion of the filtrate is neutralized, evaporated in a Pt dish and the dextrin determined by weighing before and after ignition. Error due to incomplete precipitation of starch is 1 to 2%.

Abstract in *Chem. abstr.*, 1918, v. 12, p. 2702; *Chem. Zentr.*, 1919, Bd. 2, p. 925.

1699. Keener, O. S. Report on maltose products. (Association of Official Agricultural Chemists, Journal, Washington, 1921-22, v. 5, p. 436.) PKA

Recommends that dextrins be determined by precipitation with alcohol.

IODINE METHODS OF DETERMINATION

1700. Girard, Aimé. Sur le dosage de la fécule dans les tubercules de la pomme de terre. (Académie des sciences, Comptes rendus, Paris, 1887, tome 104, p. 1629-1632.) *EO

Method is based on the fact that gelatinized potato starch absorbs a quantity of iodine which is practically constant, and is equal to 0.122 gr. per gr. of anhydrous starch. The sample is successively treated with HCl to loosen cellulose and with cuprammonium solution to dissolve the cellulose and to gelatinize the starch. The mixture is acidified with acetic acid and titrated with dilute iodine solution. A correction is made for the absorption of I by proteid substances.

Reprinted in further detail in *Annales de chimie et de physique*, 1887, série 6, tome 12, p. 275-288, PAA; *Annales de la science agronomique française et étrangère*, Paris, 1887, année 4, tome 1, p. 372-383, VPA.

Abstract in *Jour. chem. soc.*, 1887, v. 52, p. 868; *Chem. Centr.*, 1887, p. 1060; *Bull. soc. chim. Paris*, 1888, nouv. série, tome 49, semestre 1, p. 55; *Wag. Jahr.*, 1887, Jahrg. 33, p. 867.

1701. Seyfert, Friedrich. Die Zusammensetzung der Jodstärke. (Zeitschrift für angewandte Chemie, Leipzig, 1888, Jahrg. 1, p. 15-19.) PKA

Determines starch by treating the paste with iodine solution and titrating back with thiosulphate. Calculations assume 22.8% iodine in starch iodide.

Abstract in *Jour. soc. chem. ind.*, 1889, v. 8, p. 295; *Wag. Jahr.*, 1888, Jahrg. 34, p. 840.

1702. Dennstedt, M., and F. VOIGTLÄNDER. Eine neue Methode zur quantitativen Be-

stimmung der Stärke. (Forschungs-Berichte über Lebensmittel, München, 1895, Jahrg. 2, p. 173-176.)

Available in Library of the Department of Agriculture.

Have developed a method based on fact that the depth of color produced by mixing starch and iodine solutions under certain experimental conditions is proportional to the starch content. An accuracy of 0.5% is claimed.

Abstract in *Jour. soc. chem. ind.*, 1895, v. 14, p. 830; *Chem. Centr.*, 1895, Bd. 2, p. 322; *Bull. assoc. chimistes*, 1896-97, tome 14, p. 111-112.

1703. Littleton, Fannie T. Conditions affecting the volumetric estimation of starch by means of a solution of iodine. (American chemical journal, Baltimore, 1897, v. 19, p. 44-49.) PKA

The dissociating effect of water on starch iodide renders unreliable all determinations except those in which the amounts of starch do not vary widely. The size of the granules and presence of proteids are important factors.

Abstract in *Jour. chem. soc.*, 1897, v. 72, part 2, p. 235; *Jour. soc. chem. ind.*, 1897, v. 16, p. 264; *Chem. Centr.*, 1897, Bd. 1, p. 344; *Bull. soc. chim. Paris*, 1897, série 3, tome 18, p. 607.

1704. Kaiser, Albert. Die quantitative Bestimmung der Kartoffelstärke (Granulose). (Chemiker-Zeitung, Cöthen, 1902, Jahrg. 26, p. 180.) †† VOA

Method consists in precipitating starch paste quantitatively by means of iodine in presence of sodium acetate, treating the precipitate with alcoholic potassium hy-

hes and Dextrins, continued.

e Methods of Determination, continued.

de to reconvert it into starch and
ning the latter.

tract in *Jour. soc. chem. ind.*, 1902, v. 21, p.

Witte, H. Über das kolorimetrische
fahren der Stärkebestimmung von
stedt und Voigtländer. (*Zeitschrift*
Untersuchung der Nahrungs- und Ge-
nittel, Berlin, 1903, Bd. 6, p. 625-630.)
Available in Library of the Chemists'

mpares method of Dennstedt and
länder with that of Baumert and

tract in *Chem. Centr.*, 1903, Bd. 2, p. 528; *Bull.*
chimistes, 1903-04, tome 21, p. 894.

Wender, Neumann. Über eine ein-
Methode zur Bestimmung des Stärke-
tes in der Presshefe. (*Gesellschaft*
cher Naturforscher und Ärzte, Ver-
nungen, Leipzig, 1903, Theil 2, p. 96-

Available in Library of the New York
emy of Medicine.

e yeast is mixed with water and iodine
on, well stirred, and the mixture cen-
ed. The centrifugal tubes are so cali-
d that the blue deposit represents at
the percentage starch.

tract in *Jour. soc. chem. ind.*, 1903, v. 22, p. p.
Jour. chem. soc., 1904, v. 86, part 2, p. 97;
Centr., 1903, Bd. 2, p. 852-853.

Cassel, C. Note on the colorimetric
ation of starch. (*Chemical engineering*
works chemist, Dover, 1911, v. 1, p.
)

Available in Library of the Chemists'

e sample is heated with dilute salicylic
odine added to the starch solution and
oloration compared with that obtained
a known weight of starch is used.

ensed in *Zeitschrift für Spiritusindustrie*,
ahrg. 35, p. 591-592, †† VTZA.
ract in *Chem. abst.*, 1912, v. 6, p. 1860; *Chem.*
1913, Bd. 1, p. 64.

Reed, Lester. Note on the approxi-
stimation of starch by iodine. (*Chem-*
ews, London, 1911, v. 104, p. 271.)

PKA

starch is dissolved in hot glycerol,
itated with a strong iodine-KI solu-
nd the precipitate weighed after driv-
the iodine.

act in *Chem. abst.*, 1912, v. 6, p. 585.

Kreuzer, C. Über die Bestimmung
ärke in Trebern. (*Zeitschrift für das*

gesammte Brauwesen, München und Ber-
lin, 1911, Jahrg. 34, p. 277-280, 290-293.)

† VTRA

The sample is ground in a Seck mill, the
starch dissolved by strong sulphuric acid,
the resulting solution filtered, standardized
iodine solution shaken with a portion of the
filtrate which has been cooled to 1°, the
uncombined iodine is extracted with pe-
troleum spirit and a portion of the spirit
titrated with thiosulphate; 1 c.c. of N/100
iodine correspond to .025 grams starch.

Abstract in *Jour. soc. chem. ind.*, 1911, v. 30, p.
826; *Chem. abst.*, 1911, v. 5, p. 3493; *Chem. Zentr.*,
1911, Bd. 2, p. 306; *Bull. assoc. chimistes*, 1911-12,
tome 29, p. 223; *ibid.*, 1913-14, tome 30, p. 61.

1710. Long, W. S. A method for the de-
termination of starch. (*Kansas Academy of*
Science, Transactions, Topeka, 1916-17, v.
28, p. 172-174.)

* EA

The starch is precipitated with I-KI so-
lution, the mixture filtered, the residue
washed with KI solution and the filtrate
and washings titrated with thiosulphate so-
lution.

Abstract in *Chem. abst.*, 1920, v. 14, p. 1459.

1711. Fellenberg, Th. von. Eine direkt,
allgemein anwendbare Stärkebestimmungs-
methode. (*Mitteilungen aus dem Gebiete*
der Lebensmitteluntersuchung und Hy-
giene, Bern, 1916, Bd. 7, p. 369-383.)

Available in Library of the Department
of Agriculture.

This gravimetric method depends on the
solubility of starch in hot, 50% calcium
chloride solution, its precipitation by I, and
decomposition of the precipitate by alcohol.
— *Chem. abst.*

Abstract in *Jour. chem. soc.*, 1917, v. 112, part 2,
p. 342; *Chem. Zentr.*, 1917, Bd. 1, p. 450.

1712. Small, James C. Quantitative deter-
mination of soluble starch in the presence
of starch and its hydrolytic cleavage pro-
ducts. (*American Chemical Society, Jour-*
nal, Easton, 1919, v. 41, p. 107-112.) PKA

Agitates the sample in boiling water, se-
parates the ordinary starch by filtration, pre-
cipitates the soluble starch by successive
additions of I-KI solution and saturated
ammonium sulphate solution and separates
the precipitate by centrifuging. The pre-
cipitate is washed with water, again preci-
pitated by ammonium sulphate and again cen-
trifuged, 5 such washings being sufficient
to remove the red coloration due to dextrin.
The precipitate is hydrolyzed with HCl, and
the dextrose determined polarimetrically
and calculated to starch.

Abstract in *Chem. abst.*, 1919, v. 13, p. 521; *Chem.*
Zentr., 1919, Bd. 4, p. 47; *Chimie et industrie*, 1919,
v. 2, p. 705; *Bull. soc. chim. France*, 1919, série 4,
tome 26, p. 144.

1713. Ambuehl, G., and H. Weiss. Über
die Bestimmung des Stärkemehles in Wür-

Starches and Dextrins, continued.

Iodine Methods of Determination, continued.

sten und Fleischpasten (Pains). (Mitteilungen aus dem Gebiete der Lebensmitteluntersuchung und Hygiene, Bern, 1922, Bd. 13, p. 170-175.)

Available in Library of the Department of Agriculture.

Fat is extracted by rubbing with alcohol and ether, the starch dissolved by hot CaCl_2 solution, I added to the starch solution, the starch-I precipitate separated by centrifuging and its volume compared with that obtained from a known amount of starch similarly treated. The starch solutions may also be compared colorimetrically. The starch used in the standard should be of the same variety as that in the sample.

Abstract in *Chem. abst.*, 1922, v. 16, p. 3143; *Chem. Zentr.*, 1922, Bd. 4, p. 681.

1714. Denny, F. E. Methods for the estimation of small amounts of starch in plant tissue. (Association of Official Agricultural Chemists, Journal, Washington, 1922-23, v. 6, p. 175-191.) **PKA**

Finds the official acid hydrolysis method and official taka-diastase method unsuitable for amounts of starch ranging from 0 to 1%. The method found most suitable consisted essentially in dissolving the starch in concentrated CaCl_2 solution, precipitating with I, titrating the I in the precipitate and comparing the values with those given by known amounts of starch under the same conditions.

Abstract in *Chem. abst.*, 1923, v. 17, p. 1608.

1715. Weiss, H. Über die Bestimmung der unverzuckerten Stärke in Trebern. (Zeitschrift für das gesammte Brauwesen, München, 1922, Jahrg. 45, p. 122-124.)

Available in Library of the Department of Agriculture.

The spent grains are heated to boiling in a CaCl_2 solution, the mixture filtered, starch in the filtrate precipitated with I, and the precipitate separated by centrifuging; a similar procedure is carried out with pure

starch. Starch in the grains is calculated from the relative volumes of the starch iodide. Also describes a colorimetric method which does not require centrifuging.

Abstract in *Chem. abst.*, 1923, v. 17, p. 1688.

1716. Tian. Sur le dosage colorimétrique de l'amidon. (Société chimique de France, Bulletin, Paris, 1923, série 4, tome 33, p. 898-899.) **PKA**

By the use of a great excess of iodine attempts to eliminate errors due to the indefinite composition of starch-I. The color comparisons are made with red light, which is not absorbed by the excess of I but only by the starch-I.

1717. Stanesco, P. P. Les variations quantitatives de l'amidon dans les feuilles des plantes vertes pendant une journée (24 heures). (Académie des sciences, Comptes rendus, Paris, 1924, tome 178, p. 117-119.) ***EO**

Strips of leaves were placed in boiling water for 1 minute and then in 96% alcohol until the green color was removed. The strips were then treated with I-KI solution and the amount of starch estimated from the depth of shading.

Abstract in *Chem. abst.*, 1924, v. 18, p. 1005.

1718. Eckart, Hanns. Eine Bestimmungsmethode von Stärke in Pektinsäften. (Auszug.) (Chemisches Zentralblatt, Leipzig und Berlin, 1925, Bd. 2, p. 2106.) **PKA**

Pectin solutions are treated with CaCl_2 and the starch determined colorimetrically after addition of I and KI solution by comparison with known standards of starch similarly treated. Starch in concentrations from 0.01 to 1% can be determined accurately by this method. — *Chem. abst.*

1719. Griebel, C., and M. Nothnagel. Zur Verwendung von Apfelppektin enthaltenden Erzeugnissen bei der Herstellung von Marmeladen, Gelees und ähnlichen Fruchtdau-erwaren. (Zeitschrift für Untersuchung der Nahrungs- und Genussmittel, Berlin, 1925, Bd. 49, p. 352-359.) **VTa**

Starch in marmalades is determined colorimetrically by the iodine method.

SPECIFIC GRAVITY METHODS OF DETERMINATION

1720. Aimé, G. Bestimmung des Stärkemehlgehalts in den Kartoffeln. (Auszug.) (Journal für praktische Chemie, Erdmann's, Leipzig, 1837, Bd. 12, p. 190-191.) **PKA**

Shows that the relation between specific weight and starch content varies according to the variety of the potato.

1721. Fresenius, R., and Fr. Schulze. Einfaches Verfahren, das spezifische Gewicht der Kartoffeln zu bestimmen. (Journal für

praktische Chemie, Leipzig, 1850, Bd. 51, p. 436-437.) **PKA**

Abstract in *Wag. Jahr.*, 1858, Jahrg. 4, p. 280.

1722. Pohl, J. J. Ermittlung des technischen Werthes der Kartoffeln. (Akademie der Wissenschaften zu Wien, Sitzungsberichte, Mathematisch-naturwissenschaftliche Classe, 1852, Bd. 8, p. 42-51.) ***EF**

The starch content is calculated from the specific gravity.

hes and Dextrins, continued.

fic Gravity Methods of Determination, continued.

Bloch. Description du féculomètre, rétil destiné à faire connaître la proportion d'eau contenue dans des féculs vertes humides employées par diverses industries (Académie des sciences, Comptes rendus, Paris, 1854, tome 39, p. 969-973.) * **EO** Method is based on the fact that a given amount of starch at maximum hydration occupies a definite volume.

Abstract in *Jahresber. Chem.*, 1854, p. 749.

Vogel, August. Bestimmung der Stärke (Auszug.) (Jahresbericht der chemischen Technologie, Wagner's, Leipzig, Jahrg. 8, p. 408.) **VOA**

and lower results for starch content by specific gravity method than by direct weighing.

Faustner. Zur maassanalytische Bestimmung des Stärkemehls. (Archiv der Pharmacie, Hannover, 1864, Bd. 167, p. 276-277.)

Available in Library of Columbia College Pharmacy.

Starch is separated by triturating, washing, etc., and its volume measured after filtration.

Abstract in *Chem. Centr.*, 1864, p. 1103; *Zeit. Chem.*, 1864, Jahrg. 3, p. 158-159.

Schultze, W. Ueber die Kartoffelmittelst Kochsalzlösung. (Dingler's polytechnisches Journal, Augsburg, 1871, Bd. 225, p. 86-88.) **3-VA**

Number of potatoes are placed in a saturated solution of NaCl and the solution diluted until 1/2 of the potatoes have sunk to the bottom.

Printed in *Wag. Jahr.*, 1871, Jahrg. 17, p. 556-557.

Schwarzer, Aug. Schnellwaage zur Bestimmung des Stärkegehaltes der Kartoffeln. (Dingler's polytechnisches Journal, Augsburg, 1872, Bd. 203, p. 67-72.) **3-VA**

Cloez. Sur le féculomètre imaginé par M. Bloch. (Société d'encouragement l'industrie nationale, Bulletin, Paris, année 72, p. 553-555.) **VA**

Method based on fact that 10 grams of starch after standing in water, occupy 10 c.c. Ten grains of the sample is mixed with water in a specially graduated cylinder allowed to settle and from the observed volume the percent pure starch is calculated.

in *Wag. Jahr.*, 1873, Jahrg. 19, p. 546-547.

Abstract in *Jour. chem. soc.*, 1874, v. 27, p. 1015; *chim. Paris*, 1873, tome 20, p. 527-528.

1729. Bondonneau, Lucien. Sur le féculomètre. (Société chimique de Paris, Bulletin, 1874, tome 21, p. 147-148.) **PKA**

Discusses limitations of instrument described in entry 1728.

Also in *Ding. poly. Jour.*, 1874, Bd. 213, p. 172.

Abstract in *Jour. chem. soc.*, 1875, v. 28, p. 385; *American chemist*, 1874-75, v. 5, p. 308; *Wag. Jahr.*, 1874, Jahrg. 20, p. 660-661.

1730. Heidepriem, F. Ueber die Beziehungen zwischen der relativen Dichte und dem Stärkegehalt der Kartoffeln und eine neue, zur Berechnung des Stärkegehaltes der Kartoffeln aus ihrem specifischen Gewichte aufgestellte Tabelle. (Landwirtschaftlichen Versuchs-Stationen, Chemnitz, 1877, Bd. 20, p. 1-19.)

Available in Library of the Department of Agriculture.

Abstract in *Jour. chem. soc.*, 1877, v. 32, p. 233; *Jahresber. Chem.*, 1877, p. 1208.

1731. Holdefleiss. Ueber die Werthbestimmung der Kartoffeln. (Landwirthschaftliche Jahrbücher, Berlin, Supplementheft, 1877, p. 107-157.)

Available in Library of Columbia University.

Gives tables for estimation of starch and drying content of potatoes from the specific weight.

Abstract in *Ding. poly. Jour.*, 1879, Bd. 231, p. 164-165.

1732. Marke, A. Über den Stärkegehalt der Kartoffeln. (Auszug.) (Dingler's polytechnisches Journal, Augsburg, 1877, Bd. 225, p. 517.) **3-VA**

Reports starch content and specific weight of 46 potato varieties. The specific weight varied between 1.108 and 1.120 and the starch content between 20.61% and 23.52%.

Duplicate abstracts in *Chem. Centr.*, 1877, p. 678; *Wag. Jahr.*, 1877, Jahrg. 23, p. 636.

1733. Behrend, Paul, and others. Ueber die Methode der Stärkemehlbestimmung in den Kartoffeln nach dem specifischen Gewicht. Von P. Behrend, M. Maercker und A. Morgen. (Zeitschrift für Spiritusindustrie, Berlin, 1879, Jahrg. 2, p. 361-369.)

Available in Library of the Patent Office.

1734. — Ueber den Zusammenhang des specifischen Gewichts mit dem Stärkemehl- und Trockensubstanzgehalt der Kartoffeln. (Landwirtschaftlichen Versuchs-Stationen, Berlin, 1880, Bd. 25, p. 107-165.)

Available in Library of the Department of Agriculture.

Abstract in *Jour. chem. soc.*, 1880, v. 38, p. 513; *Jahresber. Chem.*, 1880, p. 1216.

Abstract with table in *Wag. Jahr.*, 1880, Jahrg. 26, p. 534-535.

Starches and Dextrins, continued.

Specific Gravity Methods of Determination, continued.

1735. Fresenius, H. Über die Bestimmung des specifischen Gewichtes der Kartoffeln, behufs Ermittlung ihres Gehaltes an Trockensubstanz und Stärkemehl. (Zeitschrift für analytische Chemie, Wiesbaden, 1881, Jahrg. 20, p. 243-248.) **PKA**

Abstract in *Wag. Jahr.*, 1881, Jahrg. 27, p. 577.

1736. Saare, Oscar. Bloch's Feculometer. (Zeitschrift für Spiritusindustrie, Berlin, 1883, N. F., Jahrg. 6, p. 898-900.)

Available in Library of the Patent Office.

1737. Guenther, Ludwig. Ueber einen neuen Apparat zur directen Untersuchung der Kartoffeln auf ihren Stärkegehalt. (Zeitschrift für Spiritusindustrie, Berlin, 1884, N. F., Jahrg. 7, p. 93-95.)

Available in Library of the Patent Office.

Abstract and diagram in *Wag. Jahr.*, 1884, Jahrg. 30, p. 743-744.

1738. Saare, Oscar. Eine neue Bestimmungsmethode des Wassergehaltes in der Kartoffelstärke des Handels. (Zeitschrift für Spiritusindustrie, Berlin, 1884, N. F., Jahrg. 7, p. 550-552.)

Available in Library of the Patent Office.

Places 100 grams of the sample in a 250 c.c. flask, fills the flask to the mark with water and observes the weight of the contents. The table given is based on the specific gravity of dry potato starch as 1.650.

Abstract in *Jour. soc. chem. ind.*, 1884, v. 3, p. 527; *Wag. Jahr.*, 1884, Jahrg. 30, p. 739-740; *Ding. poly. Jour.*, 1885, Bd. 255, p. 209; *Jahresber. Chem.*, 1885, p. 2159.

1739. Scovell, M. A., and ALBERT E. MENKE. On the composition of potatoes. (American chemical journal, Baltimore, 1887, v. 9, p. 103-107.) **PKA**

Results indicate that percent starch in potatoes does not bear a constant ratio to their specific gravity.

Abstract in *Chem. Centr.*, 1887, p. 1060.

1740. Thoerner, Wilhelm. Die Werwendung der Centrifuge bei analytischen und mikroskopischen Arbeiten. Untersuchung und Unterscheidung verschiedener Mehlsorten und Stärkearten mit Hülfe der Centrifuge. (Chemiker-Zeitung, Cöthen, 1891, Jahrg. 15, p. 1201-1203.) **†† VOA**

Equal weights of starch samples are mixed with water and centrifuged under like conditions. Finds they show widely differing volumes according to their origin.

Abstract in *Jour. soc. chem. ind.*, 1892, v. 11, p. 62.

1741. Girard, Aimé, and FLEURENT. Einen Apparat zur annähernden Bestimmung des Stärkemehlgehaltes der Kartoffeln. (Auszug.) (Central-Blatt für Agrikulturchemie, Biedermann's, Leipzig, 1892, Bd. 21, p. 858-859.)

Available in Library of the Department of Agriculture.

1742. Saare, Oscar. Die Bestimmung der Stärke in erfrorren Kartoffeln. (Zeitschrift für Spiritusindustrie, Berlin, 1897, N. F., Jahrg. 20, p. 51-52.)

Available in Library of the Patent Office.

Hard frozen potatoes are thawed in lukewarm water before determination of starch by a Keimann's balance.

Abstract in *Jour. soc. chem. ind.*, 1897, v. 16, p. 365; *Wag. Jahr.*, 1897, Jahrg. 43, p. 779.

1743. Lindet, Léon. Sur un nouveau féculomètre. (Association des chimistes, Bulletin, Paris, 1900-01, tome 18, p. 827.) **VOA**

Describes a feculometer designed by Joulin and Truchon. The instrument, like its predecessors, is based on the method of Archimedes.

1744. Mallée, A. M. Bepaling van het zetmeelgehalte van aardappelen. (Chemisch weekblad, Amsterdam, 1903-04, jaarg. 1, p. 26-27.) **† 3-VOA**

The weight of an aqueous suspension of the sample is compared with the weight of an aqueous suspension of pure starch at the same volume.

Abstract in *Chem. Centr.*, 1903, Bd. 2, p. 1091.

1745. Jaekel, R. Stärkeermittlung in gefroren Kartoffeln. (Zeitschrift für Spiritusindustrie, Berlin, 1905, N. F., Jahrg. 28, p. 64.) **† VTZA**

Cites a case in which the method of Reimann did not correctly indicate the starch value of frozen potatoes.

Abstract in *Chem. Centr.*, 1905, Bd. 1, p. 1191.

1746. Foth, G. Die Bestimmung des Stärkegehaltes der Kartoffeln nach dem spezifischen Gewicht. (Zeitschrift für Spiritusindustrie, Berlin, 1907, N. F., Jahrg. 30, p. 217-218.) **†† VTZA**

Has recalculated the old tables using the same data on which they are based. The new tables have been adopted and have been published by the Geschäftsstelle des Vereins der Spiritusfabrikanten.

Abstract in *Jour. soc. chem. ind.*, 1907, v. 26, p. 705; *Chem. Centr.*, 1907, Bd. 2, p. 99; *Bull. assoc. chimistes*, 1907-08, tome 25, p. 691-692.

1747. Heide. Apparat zum direkten Ablesen des Stärke- und Trockengehaltes in Kartoffeln. (Chemiker-Zeitung, Cöthen, 1907, Jahrg. 31, p. 398.) **†† VOA**

Consists of a large areometric spindle with a metal float and graduated stem. Five

hes and Dextrins, continued.

fic Gravity Methods of Determination, continued.

f potatoes are weighed out in a wire
t; the latter is then attached to the
and after submerging in water the per-
ge of starch and dry matter are read
e graduated scale. — *Chem. abst.*

tract in *Chem. Zentr.*, 1907, Bd. 1, p. 1455.

Ruediger. Ein Ersatz der Stärke-
e. (*Zeitschrift für Spiritusindustrie*,
n, 1913, Jahrg. 36, p. 510.) †† **VTZA**
res formula to calculate the amount of
n in potatoes. Starch=N-9/10, where
10 of weight of potatoes in water. The
s differ only 0.1% from values of
s in a table for interval 13-21% starch. —
Chem. abst.

tract in *Chem. Zentr.*, 1913, Bd. 2, p. 2169.

Vilikovský, V., and B. STEMPER.
lometer," a means of determining the
n content of potatoes. [Title trans-
(*Chemické listy pro vědu a průmysl*,
nova, Czecho-Slovakia, 1913, ročník 7,
-139.)

ilable in Library of Chemists' Club.
scribe a type of slide rule from which
arch content may be read off directly
the weight of the potatoes in air and
ter is known. Illustration is given.

tract in *Chem. abst.*, 1913, v. 7, p. 3428.

Brauer-Tuchorze, J. E. Neue Ap-
zur Untersuchung von Kartoffeln,
de und deren Fabrikaten. (*Chemische*
atur, Leipzig, 1916, Jahrg. 3, p. 199-
† **VOA**

ant's pointer balance for starch con-
a potatoes is an improvement in which
ercentage is read directly from the
In order to determine the percentage
with the same balance a double scale
vided. — *Chem. abst.*

Reichard, C. Über die Feststellung
urteilung des Nährwertes der Kar-
zum Handelswert. (*Pharmaceu-*
Zentralhalle, Dresden and Leipzig,
ahrg. 60, p. 359-363.)

lable in Library of the New York
ny of Medicine.

determination of starch in potatoes
ssary for commercial purposes. The
content can be estimated from the

specific gravity. Potatoes of specific grav-
ity 1.080 to 1.158 yield 14% to 30% of starch
in the form of starch flour. — *Chem. abst.*

1752. Sprockhoff. Stärkemilchtabellen.
(*Zeitschrift für Spiritusindustrie*, Berlin,
1922, Jahrg. 45, p. 295, 303.) †† **VTZA**

Based on the density of the solution or
suspension, a table is given from which the
starch content may be read off.

1753. — Zur Schnellorientierung des
Wassergehalts von Kartoffelstärke und
Kartoffelmehl. (*Zeitschrift für Spiritusin-*
dustrie, Berlin, 1922, Jahrg. 45, p. 327.)

†† **VTZA**

Utilizes the fact that the water content is
directly related to the density. The method
consists essentially in adjusting the specific
gravity of a non-aqueous liquid mixture so
that the starch or dextrin barely remains
suspended. Carbon tetrachloride, benzol and
tetrachlorethylene are used in the mixture,
the specific gravity of which is determined
by a special araometer. An accuracy of
0.5% is claimed.

Abstract in *Chem. Zentr.*, 1923, Bd. 2, p. 413;
Chimie et industrie, 1923, v. 10, p. 146.

1754. Foth, G. Bestimmung des Stärke-
wertes von sehr stärkearmen Kartoffeln.
(*Zeitschrift für Spiritusindustrie*, Berlin,
1924, Jahrg. 47, p. 352, 355.) †† **VTZA**

The Neiman tables for the determination
of starch have not always given good re-
sults because many potatoes had a low
starch content this season. Part of the er-
ror may have been due to potatoes contain-
ing cavities which filled with water when
the determination was made, thereby
changing the specific gravity. Tables have
been computed covering the range 7.4 to
10% starch. — *Chem. abst.*

1755. Preuss, E. Eine schnell durchführ-
bare Methode zur Bestimmung der Feuch-
tigkeit in Handelsdextrinen. (*Zeitschrift*
für Spiritusindustrie, Berlin, 1925, Jahrg.
48, p. 326-327.) †† **VTZA**

Moisture is determined by means of spe-
cific gravity measurements. Known con-
centrations of dextrin in water of specific
gravity 1.018 to 1.0799 were prepared and
tables were derived. The tables may also
be used in connection with polarimetric
readings. — *Chem. abst.*

COMPARISON OF METHODS OF DETERMINATION

Schulze, E., and M. MÄRCKER. Studien
en Brenneireiprocess. (*Journal für*
Erthschafft, Göttingen, 1872, Jahrg.
2-75, 196-220, 293-312.)

lable in Library of the Department
culture.

Find the method for calculating starch
content of potatoes by means of specific
gravity determinations is sufficiently ac-
curate for practical purposes. Conversion
of starch by amylase results in the forma-
tion of equivalent amounts of sugar and

Starches and Dextrins, continued.

Comparison of Methods of Determination, continued.

dextrin; this ratio is not affected by time of the reaction nor by the concentration of the solutions.

Abstract in *Chem. Centr.*, 1872, p. 823; *ibid.*, 1874, p. 649-651; *Wag. Jahr.*, 1874, Jahrg. 20, p. 756-760; *Bull. soc. chim. Paris*, 1873, nouv. série, tome 19, semestre 1, p. 171; *Ding. poly. Jour.*, 1872, Bd. 206, p. 245.

1757. Stumpf, M. Eine kritische Ueber-sicht der verschiedenen Methoden zur Er-mittelung des Stärkegehaltes der Kar-toffeln. (Auszug.) (Jahres-Bericht der chemischen Technologie, Wagner's, Leip-zig, 1878, Jahrg. 24, p. 741.) **VOA**

1758. Ueber Gerste und Malz. (Dingler's polytechnisches Journal, Stuttgart, 1883, Bd. 249, p. 133-138.) **3-VA**

Discusses determination of starch in bar-ley.

Abstract in *Jour. soc. chem. ind.*, 1883, v. 2, p. 544.

1759. Winton, A. L. Die Stärkebestim-mungsverfahren. (Auszug.) (Zeitschrift für angewandte Chemie, Berlin, 1888, Jahrg. 1, p. 273-274.)

Available in Library of the Chemists' Club.

Compares methods of Sachsse, Chitten-den, Märcker, and Asboth.

Also in *Journal of analytical chemistry*, Easton, 1888, v. 2, p. 149-164.

Abstract in *Wag. Jahr.*, 1888, Jahrg. 34, p. 840.

1760. Monheim, C. Die Stärkebestimmung in den Getreidekörnern. (Zeitschrift für angewandte Chemie, Leipzig, 1888, Jahrg. 1, p. 65-68.)

Available in Library of the Chemists' Club.

Results obtained by method of Asboth are unreliable. Direct inversion methods give high results due to conversion of cellu-lose. Lintner's method is recommended and described in detail.

Abstract in *Jour. chem. soc.*, 1888, v. 54, p. 1134; *Chem. Centr.*, 1888, p. 425.

1761. Schreib, H. Mitteilungen aus der Praxis der Stärkefabrikation. (Zeitschrift für angewandte Chemie, Berlin, 1888, Jahrg. 1, p. 694-696.)

Available in Library of the Chemists' Club.

Discusses examination and estimation of starch in various kinds of grain. Considers method of Asboth unsuitable for determina-tion of starch in rice. Method of Lintner is recommended.

Abstract in *Jour. soc. chem. ind.*, 1889, v. 8, p. 127; *Chem. Centr.*, 1889, Bd. 1, p. 85; *Wag. Jahr.*, 1888, Jahrg. 34, p. 841-844.

1762. Ueber Fortschritte in der Spiritus-fabrikation. (Dingler's polytechnisches Journal, Stuttgart, 1888, Bd. 268, p. 91-95.)

3-VA

Describes briefly the starch estimation methods of Reinke and Asboth.

Abstract in *Jour. soc. chem. ind.*, 1888, v. 7, p. 448.

1763. Milkowski, Z. von. Zur Bestimmung des Stärkemehles in Getreidearten. (Zeit-schrift für analytische Chemie, Wiesbaden, 1890, Jahrg. 29, p. 134-136.) **PKA**

Substitutes carbon disulphide for ether in preliminary extraction recommended by As-both. The method of Märcker is described. The two methods give concordant results. Direct acid inversion methods are unreliable because cellulose and pectin substances are calculated as starch.

Abstract in *Jour. soc. chem. ind.*, 1890, v. 9, p. 773; *Chem. Centr.*, 1890, Bd. 1, p. 982; *Jahresber. Chem.*, 1890, p. 2515.

1764. Stone, Winthrop E. Comparison of methods for the estimation of starch. (American Chemical Society, Journal, Easton, 1894, v. 16, p. 726-733.) **PKA**

Compares methods of Sachsse, Guichard, Baudry, and Asboth. Concordant results are obtained when using pure starch. How-ever, certain substances, which give no iodine reaction, show a high percent starch; this discrepancy is attributed to the pres-ence of pentosans. Recommends that the sample be digested with diastase, filtered, the filtrate inverted with acid and the sugars titrated.

Abstract in *Jour. soc. chem. ind.*, 1895, v. 14, p. 317.

1765. — A comparison of methods for the determination of starch. (United States. — Bureau of Chemistry, Washington, 1894, Bulletin no. 43, p. 162-166.) **VPH**

1766. Sherman, Henry C. A study of methods for the determination of starch. (School of Mines quarterly, New York, 1896, v. 17, p. 356-365.) **OA**

Tabulates starch content in 7 varieties of samples as shown by 6 commonly used methods. Correlates high results obtained with amount of pentoses formed by in-version. Annotated bibliography of princi-pal methods.

Abstract in *Jour. soc. chem. ind.*, 1896, v. 15, p. 832.

1767. Fresenius, W., and L. GRÜNHUT. Ueber die Bestimmung der Stärke in Cere-alien, Kartoffeln und in der Handelsstärke. (Zeitschrift für analytische Chemie, Wies-baden, 1896, Jahrg. 35, p. 607-628.) **PKA**

A survey of various methods.

1768. Wiley, Harvey W., and WILLIAM H. KRUG. Comparison of the standard methods

es and Dextrins, continued.

arison of Methods of Determination, continued.

ne estimation of starch. (American Chemical Society, Journal, Easton, 1898, v. 253-266.)

PKA

estigate the pressure method and the ods of Stone, Reinke, Baudry, Gui- and Lindet. In Lindet's method par- of fiber are weighed as starch and not arch is removed from the sample. mment a combination of Lindet's d and digestion by diastase; also mment the use of diastase under pres-

mary in *Bull. assoc. chimistes*, 1898-99, tome 1899-609.

ract in *Jour. soc. chem. ind.*, 1898, v. 17, p. 1072; *Bull. soc. Paris*, 1898, série 3, tome 20, p. 576; *Wag.* 1898, Jahrg. 44, p. 772-773.

Lintner, Carl J. Über die Bestim- des Stärkemehlgehaltes in Cerealien. chrift für angewandte Chemie, Berlin, o. 725-729.)

PKA

ermine starch in barleys by 3 differ- methods. Discusses effect of pentosans ults and describes a method which uines and allows for the pentosans t.

ract in *Jour. soc. chem. ind.*, 1898, v. 17, p. 644.

Dewalque, F. Du dosage de la fécule es levures mélangées. (Association des chimistes, Bulletin, Bruxelles, nnée 12, p. 264-269.)

PKA

Belgian law classifies, as mixed all manufactured yeast containing han 3% starch. The author discusses methods of determination, but mends only the method of Märcker. s that results be referred to yeast ing 74% water.

act in *Jour. soc. chem. ind.*, 1899, v. 18, p.

Strasburger, J. Über den quantita- Nachweis der leicht angreifbaren ydrate (Stärke und ihrer Abköm- n menschlichen Fäces. (Archiv für amnte Physiologie, Pflüger's, Bonn, d. 84, p. 173-190.)

QCA

ribes several methods.

ct in *Jour. chem. soc.*, 1901, v. 80, part 2, *chem. Centr.*, 1901, Bd. 1, p. 798.

Sjollema, B., and H. W. DE KRUIJFF. bepaling in aardappelen. (Chemisch d, Amsterdam, 1907, jaarg. 4, p. 523-
†3-VOA

are gravimetric and submersion s.

ct in *Chem. Centr.*, 1907, Bd. 2, p. 1021.

1773. **Neumann**, O. Ueber die Bestim- mung der Stärke in der Gerste. (Wochen- schrift für Brauerei, Berlin, 1909, Jahrg. 26, p. 306-309.)

†VTRA

Reviews polarimetric and refractometric methods.

Abstract in *Chem. abst.*, 1910, v. 4, p. 689.

1774. **Giltay**, Anna, and J. J. BLANKSMA. De titrimetrische en polarimetrische meth- oden ter bepaling van zetmeel. (Chemisch weekblad, Amsterdam, 1909, jaarg. 6, p. 459-480.)

†3-VOA

A critical discussion.

Abstract in *Chem. abst.*, 1909, v. 3, p. 2761; *Chem. Zentr.*, 1909, Bd. 2, p. 658.

1775. **Scholl**, A. Die Bestimmung der Stärke in Futter- und Nahrungsmitteln. (Zeitschrift für Untersuchung der Nah- rungs- und Genussmittel, Berlin, 1909, Bd. 18, p. 157-166.)

Available in Library of the Chemists' Club.

Has carried out parallel determinations of starch in potatoes, fodder and pepper by the specific gravity method, the steam- pressure method, Liebermann's, Lintner's and Ewer's methods. The last three gave comparable results while the first two were invariably low.

Abstract in *Chem. abst.*, 1910, v. 4, p. 62; *Chem. Zentr.*, 1909, Bd. 2, p. 935.

1776. **Koenig**, J., and W. SUTTHOFF. Zur Kenntnis der sogenannten stickstofffreien Extraktstoffe in den Futter- und Nahrungs- mitteln. (Landwirtschaftliches Versuchs- Stationen, Berlin, 1909, Bd. 70, p. 343-403.)

Available in Library of the Department of Agriculture.

Include comparison of methods for starch determination.

Abstract in *Chem. abst.*, 1910, v. 4, p. 1329; *Chem. Zentr.*, 1909, Bd. 2, p. 304.

1777. **Manaresi**, Angelo, and MARIO TONE- GUTTI. Sulla determinazione dell'amido nei rami degli alberi. (Stazione sperimentali agrarie italiane, Modena, 1910, v. 43, p. 705-713.)

Available in Library of the Department of Agriculture.

Among the various methods tried, the autoclave and Allihn methods gave the best results. The use of the pressure flask method gave much too low results and was rejected. — *Chem. abst.*

Abstract in *Chem. Zentr.*, 1911, Bd. 1, p. 332, 758.

1778. **Kreis**, Hans. Über Versuche zur Stärkebestimmung im Tafelsenf. (Chemiker-Zeitung, Cöthen, 1910, Jahrg. 34, p. 1021-1023.)

††VOA

Four methods were studied and a modi-

*Starches and Dextrins, continued.**Comparison of Methods of Determination, continued.*

fication of Mayrhofer's method recommended.

Abstract in *Chem. abst.*, 1911, v. 5, p. 929; *Bull. soc. chim. France*, 1911, série 4, tome 10, p. 620.

1779. Schubert, Friedrich. Über Stärkebestimmungen. (Österreichisch-ungarische Zeitschrift für Zuckerindustrie und Landwirtschaft, Wien, 1910, Jahrg. 39, p. 411-422.)

Available in Library of the Department of Agriculture.

Tabulates results obtained by various methods and details a modification of Lintner's method.

Abstract in *Chem. Zentr.*, 1910, Bd. 2, p. 688.

1780. Frei, August. Untersuchungen über die Bestandteile der Kaferkörner unter dem Einfluss verschiedener Witterungs- und Anbauverhältnisse. (Landwirtschaftliches Versuchs-Stationen, Berlin, 1910, Bd. 72, p. 161-310.)

Available in Library of the Department of Agriculture.

Includes comparison of methods for starch determination.

Abstract in *Chem. Zentr.*, 1910, Bd. 1, p. 1545.

1781. Vries, H. J. F. de. Onderzoekingen omtrent de bepaling van het zetmeelgehalte van aardappelen. (Verslagen van landbouwkundige onderzoekingen der Rijkslandbouwproefstations, Groningen, 1915, no. 18, 82 p.)

Available in Library of the Department of Agriculture.

Tabulates comparative results obtained by several methods. Determines starch indirectly by subtracting from the total, the weight of water, ash, cellulose, ether extract, proteins and pentosans. Recommends the new Groningen table for determination of true starch content and density.

Abstract in *Chem. abst.*, 1916, v. 10, p. 2248; *Jour. soc. chem. ind.*, 1916, v. 35, p. 647; *Chem. Zentr.*, 1916, Bd. 1, p. 118.

1782. Smith, W. B. Report on meat and fish. (Association of Official Agricultural Chemists, Journal, Washington, 1915, v. 1, p. 170-181.)

PKA

Makes comparative determinations of starch by the methods of Price and of Mayrhofer and Sachsse. Finds the method of Price is simpler, quicker and more accurate.

1783. Kutscha, Richard. Die Stärkebestimmung. (Wochenschrift für Brauerei, Berlin, 1917, Jahrg. 34, p. 277-281, 290-291, 294-295, 304-306, 313-316, 323-325, 332-334, 339-

341, 350-352, 359-360, 368, 375, 381-384, 391-392, 398-400, 406-408.)

Available in Library of the Department of Agriculture.

Gives a comprehensive resume of the methods which have been proposed for estimation of starch, especially in barley. Also gives experimental results which have been obtained by the author using different methods. The methods of Märcker and Morgan, and of Lintner have been found most favorable.

Abstract in *Institutes of Brewing, Journal*, London, 1918, v. 24, p. 175; *Chem. abst.*, 1918, v. 12, p. 1681.

1784. Parow, Edmund. Bericht über die technisch-wissenschaftlichen Arbeiten in der Generalversammlung des Vereins der Stärke-Interessenten in Deutschland. (Zeitschrift für Spiritusindustrie, Berlin, 1922, N. F., Jahrg. 45, p. 51-53.)

†† VTZA

Compares 6 methods for determination of starch.

Abstract in *Chem. Zentr.*, 1922, Bd. 2, p. 1224.

1785. — Beitrag zur Nachprüfung der praktischen Methoden zur Bestimmung der technisch gewinnbaren Stärke in Schlammstärke. (Zeitschrift für Spiritusindustrie, Berlin, 1922, Jahrg. 45, p. 149.)

†† VTZA

Determines technically recoverable starch in 12 samples of starch pulp, using Klopff's method, the usual washing method, washing with air agitation, total starch by Reinke's method, polarization and washing with ammonia. Results are compared with total starch determined by the Märcker-Delbrück method.

Abstract in *Jour. soc. chem. ind.*, 1922, v. 41, p. 512A; *Chem. Zentr.*, 1922, Bd. 4, p. 382.

1786. Frankenbach, H. Die Methoden zur Bestimmung der Stärke. (Papier-Fabrikant, Berlin, 1922, Jahrg. 20, p. 1173-1178.)

† VMPA

Discusses a number of methods with special reference to the determination in paper and paper raw materials.

Abstract in *Chem. Zentr.*, 1922, Bd. 4, p. 805; *Chimie et industrie*, 1923, v. 9, p. 979.

1787. Alpers, K., and H. ZIEGENSPECK. Beiträge zur Beurteilung der Stärkebestimmungsverfahren. (Zeitschrift für Untersuchung der Nahrungs- und Genussmittel, Berlin, 1923, Bd. 45, p. 163-174.)

VTA

A comparative investigation of the starch estimation methods of Mayrhofer, v. Fellenberg, Baumert-Bode-Witte, Evers, Lintner-Belschner, Lehmann-Schowalter, and Liebermann.

Abstract in *Chem. abst.*, 1924, v. 18, p. 1164; *Jour. soc. chem. ind.*, 1923, v. 42, p. 903A; *Chem. Zentr.*, 1923, Jahrg. 94, Bd. 4, p. 671.

es and Dextrins, continued.

Comparison of Methods of Determination, continued.

Duering, A. Vergleichende Stärkebestimmung in Fleischwaren durch Polarisation und Gewichtsanalyse. (Zeitschrift für Untersuchung der Nahrungs- und Genußmittel, Berlin, 1924, Bd. 47, p. 248-251.)

VTA

Using the polarimetric method of Ewer and gravimetric method of Mayrhofer, comparative determinations of starch

in a number of meat products. A close agreement between the two methods is found.

Abstract in *Chem. abstr.*, 1924, v. 18, p. 2564; *Chem. Zentr.*, 1924, Bd. 2, p. 900.

1789. Wolff, Ottomar. Die Bestimmung der Stärke in Pflanzenteilen insbesondere in Pülpe. (Zeitschrift für Spiritusindustrie, Berlin, 1924, Jahrg. 47, p. 178.) †† VTZA

Discusses methods of Lintner, Ewers, and Märcker. Recommends that the sample be first ground in sand and then tested by the method of Märcker.

DETECTION, DIFFERENTIATION AND IDENTIFICATION

Marozeau. Neues Mittel die Kartstärke von der Getreidestärke zu unterscheiden und die Gegenwart der ersteren nachzuweisen. (Abgekürzt.) (Journal für technische und ökonomische Chemie, Ann's, Leipzig, 1833, Bd. 7, p. 265-267.)

PKA

Depends on an odor developed when potato starch is treated with HCl.

Claubry, Gaultier de. Sur le concours pour un procédé propre à reconnaître la fécule de blé. (Société d'encouragement pour l'industrie nationale, Bulletin, Paris, 1835, tome 34, p. 14.)

VA

— Sur le concours pour un procédé propre à reconnaître le mélange de la fécule avec la farine de blé. (Société d'encouragement pour l'industrie nationale, Bulletin, Paris, 1836, année 35, p. 459-460.)

VA

Trommer. Unterscheidung von Dextrin, Traubenzucker und Rohrzucker. (Annalen der Chemie und Pharmacie, Liebigs, Heidelberg, 1841, Bd. 39, p. 362.)

PKA

Alkaline copper oxide solution.

Scharling. Verdünnte Salzsäure als Reagens zur Untersuchung, ob Reismehl oder Malaguti'sches Salep mit Kartoffelstärke vermischt sind. (Annalen der Chemie und Pharmacie, Heidelberg, 1842, Bd. 42, p. 272-273.)

PKA

Gobley. Ueber die Färbung verschiedener Stärkearten durch Joddampf. (Dingler's polytechnisches Journal, Stuttgart, 1844, Bd. 92, p. 128-130.)

3-VA

Malaguti, F. Note sur l'amidon norvégien et les toiles de chanvre. (Académie des Sciences, Comptes rendus, Paris, 1846, tome 22, p. 42-543.)

*EO

hemp cloth gives the I coloration when it has not been sized with starch.

Sizing starch and normal starch may be distinguished by employing successively animal charcoal and I.

Reprinted in further detail in *Annales de chimie et de physique*, 1846, série 3, tome 18, p. 168-178, P.A.A.

Abstract in *Jour. prakt. Chem.*, 1846, Bd. 39, p. 167-168.

1795. Mayet. De l'action de la potasse caustique sur les fécules et de son emploi pour les distinguer entre elles et apprécier les proportions de leurs mélanges. (Journal de pharmacie et de chimie, Paris, 1847, série 3, tome 11, p. 81-86.)

WTA

Various starches are treated with alkali and distinguished by the consistence, color, transparency, etc., of the resulting mass.

Reprint in *Ding. poly. Jour.*, 1847, Bd. 104, p. 107-110.

Summarized in *Jour. prakt. Chem.*, 1847, Jahrg. 40, p. 435-437.

1796. Pohl, J. J. Nachweisung von Stärke im Indigo und Erkennung von Jodstärke in Berlinerblau. (Akademie der Wissenschaften zu Wien, Sitzungsberichte, Mathematisch-naturwissenschaftliche Classe, 1854, Bd. 12, p. 107-108.)

*EF

Abstract in *Jour. prakt. Chem.*, 1854, Bd. 63, p. 382-384; *Polytechnisches Notizblatt*, 1855, Jahrg. 10, p. 47.

1797. Girardin, and BIDARD. Sur la fécule du cacao. (Journal de pharmacie et de chimie, Paris, 1860, tome 38, p. 266-267.)

WTA

The presence of starches as adulterants in cocoa and chocolate may be detected by means of the microscope and an ethereal iodine solution.

Abstract in *Bull. soc. chim. Paris*, 1860, tome 2, p. 358.

1798. Puscher, C. Ueber die Verfälschung des Mehls und der Weizenstärke mit Kartoffelstärke. (Dingler's polytechnisches Journal, Stuttgart and Augsburg, 1860, Bd. 155, p. 391.)

3-VA

Potato starch is detected by development of the characteristic odor of fusel oil when treated with H₂SO₄.

Abstract in *Wag. Jahr.*, 1860, Jahrg. 6, p. 337.

*Starches and Dextrins, continued.**Detection, Differentiation and Identification, continued.*

1799. **Guensberg**, Rudolf. Über das Verhalten von Gummi gegen Eiweisskörper. (Akademie der Wissenschaften zu Wien, Sitzungsberichte, Mathematisch-naturwissenschaftliche Classe, 1862, Bd. 45, Abt. 2, p. 643-646.) *EF

Upon adding a solution of dextrin to slightly acidulated albumin a voluminous precipitate is formed which is insoluble in an excess of dextrin. Gum arabic forms a similar precipitate which, however, is soluble in an excess of the gum. The method is suggested as a means of differentiating dextrins and gum arabic.

Condensed in *Bull. soc. chim. Paris*, 1863, p. 279-280.

1800. **Payen**, A. Action de l'iode sur l'amidon du cacao. (Extrait.) (Journal de pharmacie et de chimie, Paris, 1862, série 3, tome 41, p. 367.) WTA

Abstract in *Zeitschrift für analytische Chemie*, Wiesbaden, 1863, Bd. 2, p. 444; *Chem. Centr.*, 1864, p. 544.

1801. **Albers**, J. F. Prüfung der Marantastärke (Arrow Root) auf Stärkemehl aus Kartoffeln und Weizen. (Archiv der Pharmacie, Hannover, 1863, Bd. 163, p. 210-211.)

Available in Library of Columbia College of Pharmacy.

Also in *Zeit. anal. Chem.*, 1863, Jahrg. 2, p. 217-218.

Abstract in *Chem. Centr.*, 1864, p. 416.

1802. **Marchand**, E. Nouveau mode d'essai du tapioca par l'iode. (Journal de pharmacie et de chimie, Paris, 1864, série 3, tome 45, p. 308-311.) WTA

Abstract in *Jahresber. Chem.*, 1864, p. 731.

1803. **Pruefung** des Glycerin auf Zucker oder Dextrin. (Deutsche Industriezeitung, Chemnitz, 1868, Nr. 21, p. 206.) †VA

Glycerin boiled with ammonium molybdate and a trace of nitric acid does not ordinarily give any coloration, but if sugar or dextrin is present a blue coloration is obtained.

Abstract in *Bull. soc. chim. Paris*, 1868, nouv. série, tome 10, semestre 2, p. 322.

1804. **Boettger**, R. Über eine einfache Nachweisung von Weizenstärke im Arrowroot oder überhaupt von Getreidemehl im Stärkemehl. (Polytechnisches Notizblatt, Mainz, 1869, Jahrg. 24, p. 237.) VA

Also in *Jahresber. Chem.*, 1870, p. 1190; *Neues Jahrbuch für Pharmacie*, Speyer, 1869, Bd. 32, p. 47-48.

1805. **Hager**, H. Zur Unterscheidung von Gummi arabicum und Dextrin. (Pharmaceu-

tisches Centralhalle, Berlin, 1871, Jahrg. 12, p. 206.)

Available in Library of Columbia College of Pharmacy.

Gum arabic does not contain sugar, gives a milky precipitate with oxalic acid and a yellow precipitate with iron salts.

Abstract in *Chem. Centr.*, 1873, p. 27.

1806. **Scheibler**. Dextrin as an adulterant of sugar. (Abstract.) (American chemist, New York, 1871-72, v. 2, p. 179-181.) PKA

Finds that the adulteration of sugar by dextrin may be recognized by the action of alcohol, by the I coloration, by the differences between polarization before and after inversion and by the absorbent action exercised on dextrine by animal charcoal.

1807. **New test** for starch. (Scientific American, New York, 1872, v. 26, p. 25.)

††VA

Claims that precipitation by tannic acid is a more delicate test than the iodine coloration.

1808. **Hager**, H. Nachweis von Dextrin im Arabischen Gummi. (Pharmaceutisches Centralhalle, Berlin, 1873, Jahrg. 14, p. 201-202.)

Available in Library of Columbia College of Pharmacy.

When the suspected mixture is covered with a solution of FeCl_3 it is noted that all gum arabic particles remain attached to the bottom of the vessel.

Abstract in *Chem. Centr.*, 1873, p. 408; *Bull. soc. chim. Paris*, 1873, nouv. série, tome 20, semestre 2, p. 508.

1809. — Zur Erkennung von Stärke in Milch. (Auszug.) (Jahresbericht der Chemie, Giessen, 1873, p. 974.) PKA

1810. — Untersuchung der Milch auf Stärkemehl. (Pharmaceutisches Centralhalle, Berlin, 1878, Jahrg. 19, p. 371.)

Available in Library of Columbia College of Pharmacy.

When using iodine to indicate the presence of starch in milk, allowance must be made for the fact that the lactoprotein bodies combine with I. I solution must be added in portions until the solution is either yellow or blue.

Abstract in *Jour. chem. soc.*, 1879, v. 36, p. 674; *Chem. Centr.*, 1878, p. 783.

1811. **Pickering**, Spencer U. The detection of starch and dextrin. (Chemical news, London, 1880, v. 42, p. 311-312.) PKA

Abstract in *Jahresber. Chem.*, 1880, p. 1214.

1812. **Geissler**, E. Zum Nachweis von Stärkezucker. (Pharmaceutisches Centralhalle, Berlin, 1882, Jahrg. 23, p. 524.)

Available in Library of Columbia College of Pharmacy.

Abstract in *Chem. Centr.*, 1882, p. 828.

ches and Dextrins, continued.

ction, Differentiation and Identification, continued.

Symons, W. H. Tumefaction as an aid in the identification of the varieties of potato and other starches. (*Pharmaceutical journal and transactions*, London, 1883, series 3, v. 13, p. 237-238.) **WTA**
Starch grains are stirred for 10 minutes in alkali solutions of varying concentrations and the grains then examined under microscope. The relative number of grains swollen at each concentration serves as a method of differentiation for the varieties of starches. Gives results for 11 varieties. Abstract in *Jour. chem. soc.*, 1884, v. 46, p. 370; *Chem. Centr.*, 1883, p. 175.

Hanausek, T. F. Über die mikroskopische Nachweisung des Kastanienmehles. (Zusatz.) (*Dingler's polytechnisches Journal*, Stuttgart, 1883, Bd. 250, p. 230.) **3-VA**
Abstract in *Jahresber. Chem.*, 1883, p. 1746.

Egger, E. Bemerkungen zur Prüfung des Weines auf Kartoffelzucker. (*Archiv für Hygiene*, München und Leipzig, 1884, Bd. 2, p. 252-253.) **SPA**
Remarks on the recent article of Nessler at Barth. Abstract in *Chem. Centr.*, 1884, p. 716.

Hager, H. Zur Erkennung eines mit Rohrzucker, sowie mit Rohrzucker versetzten, Honig. (*Pharmaceutisches Centralblatt*, Berlin, 1885, Jahrg. 26, p. 327-328.)

Available in Library of Columbia College Pharmacy.

Detection of maize-starch syrup in honey. Abstract in *Jour. soc. chem. ind.*, 1886, v. 5, p. 301.

Heinricher, E. Verwendbarkeit des Javelle zum Nachweis kleinster Mengen. (*Zeitschrift für wissenschaftliche Mikroskopie*, Braunschweig, 1888, Bd. 3, p. 213-215.) **OCA**
Abstract in *Chem. Centr.*, 1886, p. 741.

Zipperer, Paul. Ueber den Werth der mikroskopischen Untersuchung bei der Erkennung fremden Stärkemehls in Schokolade. (*Chemiker-Zeitung*, Cöthen, 1888, Jahrg. 12, p. 26.) **VOA**
Method capable of detecting 1 part starch in 100 parts chocolate. Abstract in *Jour. soc. chem. ind.*, 1888, v. 7, p. 233.

Fresenius, W. Zur Kenntnis der Honigzuckerhaltigen Weine. (*Zeitschrift für analytische Chemie*, Wiesbaden, 1891, Jahrg. 30, p. 669-672.) **PKA**

Confirms results of Medicus and Immermann. Abstract in *Jour. chem. soc.*, 1892, v. 62, p. 922; *Chem. Centr.*, 1892, Bd. 1, p. 722.

1820. Beckmann, Ernst. Beiträge zur Prüfung des Honigs. (*Zeitschrift für analytische Chemie*, Wiesbaden, 1896, Jahrg. 35, p. 263-284.) **PKA**

Dextrin is detected by its iodine reaction and by its barium hydroxide precipitate. Dialysis of a honey solution does not remove dextrin.

Abstract in *Jour. soc. chem. ind.*, 1896, v. 15, p. 623.

1821. Possetto, G. Sulla ricerca delle sostanze fecolacee nel cioccolato. (*Giornale di chimica e farmacia e di scienze affini*, Torino, 1898, tomo 47, p. 5-8.)

Available in Library of Surgeon General's Office.

With chocolate or cocoas, the permanence of the blue iodine reaction indicates the adulteration of the sample with starch.

Abstract in *Jour. soc. chem. ind.*, 1898, v. 17, p. 381; *Chem. Centr.*, 1898, Bd. 1, p. 418; *Bull. soc. chim. Paris*, 1898, série 3, tome 20, p. 447.

1822. Baumann, Karl. Nachweis von Maisstärke im Weizenmehl. (*Zeitschrift für Untersuchung der Nahrungs- und Genussmittel*, Berlin, 1899, Bd. 2, p. 27-29.) **VTA**

Maize starch is detected, in the presence of wheat and rye meal, by the fact that the granules of the latter starches are ruptured much more quickly by the action of dilute KOH. Method can be applied to quantitative determinations.

Abstract in *Jour. soc. chem. ind.*, 1899, v. 18, p. 301.

1823. Borntraeger, Hugo. Ueber eine einfache Unterscheidung von Knochenleim, Dextrin und arabischem Gummi. (*Oesterreichische Chemiker-Zeitung*, Wien, 1900, Jahrg. 3, p. 188-189.)

Available in Library of the Department of Agriculture.

Abstract in *Chem. Centr.*, 1900, Bd. 1, p. 1109.

1824. Embrey, G. Detection of maize in wheaten flour. (*Analyst*, London, 1900, v. 25, p. 315-317.) **PKA**

Modifies method of Baumann. After gelatinization of the wheat starch by KOH, maize starch is determined colorimetrically by iodine. Two other methods are mentioned in the following discussion.

Abstract in *Jour. soc. chem. ind.*, 1901, v. 20, p. 72.

1825. Lagerheim, G. Iodolactic acid as a reagent for starch. (Abstract.) (*Society of Chemical Industry, Journal*, London, 1901, v. 20, p. 1245.) **VOA**

Use of iodolactic acid in the examination of the starch grains of foods and drugs.

1826. Dubosc, A. Über eine Methode zur Unterscheidung der verschiedenen stärkehaltigen Stoffe durch Joddämpfe. (*Chem-*

*Starches and Dextrins, continued.**Detection, Differentiation and Identification, continued.*

iker-Zeitung, Cöthen, 1904, Jahrg. 28, p. 1149.) †† VOA

Iodine vapor produces markedly varied colorations with starches of different origins.

Abstract in *Jour. soc. chem. ind.*, 1904, v. 23, p. 1240.

1827. Collin, Eugène. Examen microscopique des farines et recherche du riz dans la farine de blé. (*Journal de pharmacie et de chimie*, Paris, 1906, série 6, tome 24, p. 385-395.)

Available in Library of the New York Academy of Medicine.

1828. Gastine, G. Sur un nouveau procédé d'analyse microscopique des farines et la recherche du riz dans les farines de blé. (*Académie des sciences, Comptes rendus*, Paris, 1906, tome 142, p. 1207-1210.) *EO

The sample is stained, dried, mounted and examined under the microscope. The hilum of the rice starch granule is plainly shown up, while wheat starch rarely exhibits a visible hilum; the granules of maize and buckwheat starches behave like rice.

Abstract in *Jour. soc. chem. ind.*, 1906, v. 25, p. 656; *Jour. chem. soc.*, 1906, v. 90, part 2, p. 587.

1829. Hockauf, J. Über den Nachweis geringer Mengen von Mehl oder Stärke im Paprikapulver. (Auszug.) (*Chemisches Central-Blatt*, Berlin, 1906, Bd. 2, p. 281.) PKA

The sample is treated with alcoholic iodine solution and chloralhydrate solution.

1830. Bellier, J. Recherche microscopique des farines étrangères dans la farine de blé, particulièrement du riz et de la féverolle. (*Annales de chimie analytique*, Paris, 1907, tome 12, p. 224-229.) PKA

Utilizes the fact that granules of various starches show varying degrees of resistance to the action of KOH.

Abstract in *Jour. soc. chem. ind.*, 1907, v. 26, p. 1025; *Chem. Zentr.*, 1907, Bd. 2, p. 430.

1831. Gastine, G. Sur l'emploi de la lumière polarisée pour la recherche microscopique des amidons composés du riz et du maïs dans la farine de froment. (*Académie des sciences, Comptes rendus*, Paris, 1907, tome 144, p. 35-37.) *EO

Starch cells have a characteristic appearance when examined in simple polarized light and in polarized light modified by a plate of gypsum giving the red of the first order. A number of starches are examined.

Condensed in *Bull. assoc. chimistes*, 1907-08, tome 25, p. 268.

Abstract in *Jour. soc. chem. ind.*, 1907, v. 26, p. 108; *Jour. chem. soc.*, 1907, v. 92, part 2, p. 137.

1832. Rösényi, Iván. Die Bestimmung der Kartoffel im Brot. (*Chemiker-Zeitung*, Cöthen, 1907, Jahrg. 31, p. 559-561.)

†† VOA

The presence of potato-meal is detected by a difference in N and ash content and in acidity.

Abstract in *Bull. soc. chim. France*, 1907, série 4, tome 2, p. 1019.

1833. Herman, M. Recherche médico-légale de la fécule par l'emploi de la lumière polarisée. (*Société chimique de Belgique, Bulletin*, Gand, 1908, tome 22, p. 340-342.) PKA

The appearance of starch grains under the polarizing microscope is very characteristic. The use of this instrument enables the detection of starch where other methods fail.

1834. Parow, Edmund. Über Verfälschungen von Kartoffelstärke mit Maisstärke. (*Zeitschrift für Spiritusindustrie*, Berlin, 1908, N. F., Jahrg. 31, p. 286-287.) †† VTZA

The presence of corn starch is shown by a microscopical examination and by the protein content. Gives characteristics for 39 commercial starches.

Abstract in *Chem. abst.*, 1909, v. 3, p. 968; *Bull. assoc. chimistes*, 1908-09, tome 26, p. 512.

1835. Collin, Eugène. L'amidon dans les moutardes de table. (*Annales des falsifications*, Paris, 1909, année 2, p. 206-215.) VTD

Finds the microscopical appearance of normal starch in mustard is sufficiently characteristic to enable a positive identification of starches present as adulterants.

Abstract in *Chem. abst.*, 1909, v. 3, p. 2718; *Chem. Zentr.*, 1909, Bd. 2, p. 1137.

1836. Curtel, G. Analyse des moutardes. (*Annales des falsifications*, Paris, 1909, année 2, p. 327-333.) VTD

Includes directions for detection of added starch in mustard.

Abstract in *Chem. Zentr.*, 1910, Bd. 1, p. 386.

1837. Fiehe, J. Über die Erkennung von Stärkesirup und Stärkezucker in Honig und in Fruchtsäften. (*Zeitschrift für Untersuchung der Nahrungs- und Genussmittel*, Berlin, 1909, Bd. 18, p. 30-33.)

Available in Library of the Chemists' Club.

Method is based upon the observation that in the presence of acids the precipitation by ethyl alcohol of the dextrins naturally occurring in honey is prevented, while the precipitation of starch dextrins still takes place.

Abstract in *Chem. abst.*, 1909, v. 3, p. 2836; *Jour. soc. chem. ind.*, 1910, v. 29, p. 106.

es and Dextrins, continued.

tion, Differentiation and Identification, continued.

Griebel, C. Nachweis von Patentmehl im Brot. (Zeitschrift für Untersuchung der Nahrungs- und Genussmittel, 1909, Bd. 17, p. 657-661.)

Available in Library of the Chemists'

Lenz, W. Eine neue mikrochemische scheidung der Roggen- und Weizen-. (Apotheker-Zeitung, Berlin, 1909, 24, p. 427-428.)

Available in Library of Columbia Collegearmacy.

Fornet, A. Verbesserte Methode zur nennung der Unterschiede feiner Farben bei Stärke, Mahlprodukten und ulvern. (Chemiker-Zeitung, Cöthen, Jahrg. 34, p. 1285.)

†† VOA
Abstract in *Chem. abst.*, 1911, v. 5, p. 1205.

Lenz, Wilhelm. Eine neue mikro-sche Unterscheidung der Roggen- und nstärke. (Zeitschrift für öffentliche e, Plauen, 1910, Jahrg. 15, p. 224-227.)

VOA
Method based on fact that rye starch much more quickly in sodium salicy- lution than do other starches.

Abstract in *Jour. soc. chem. ind.*, 1909, v. 28, p. em. Zentr., 1909, Bd. 2, p. 476.

— Ein neues Untersuchungsver- für Stärkekörner. (Apotheker Zei- Berlin, 1910, Jahrg. 25, p. 777-779.)

Available in Library of Columbia Collegearmacy.

procedure described in entry 1841 trated with various photographs.

Abstract in *Chem. abst.*, 1911, v. 5, p. 1162; *Bull. imistes*, 1911-12, tome 29, p. 229.

Collin, Eugène. Examen microsco- les confitures. (Annales des falsifica- Paris, 1911, année 4, p. 613-635.)

VTD
Is method for detection of starches, arly buckwheat starch.

Abstract in *Chem. Zentr.*, 1912, Bd. 1, p. 686.

Neger, F. W. Eine abgekürzte Jod- (Deutsche botanische Gesellschaft, e, Berlin, 1912, Jahrg. 30, p. 93-96.)

Available in Library of Columbia Uni-

gives simple method for detecting ence of starch in leaves.

Armani, G., and I. BARBONI. Intorno i di sostanze adhesive solubili. (An-

nali di chimica applicata, Roma, 1914, v. 1, p. 138-142.)

Available in Library of the Chemists' Club.

Colorimetric methods for detection of dextrin and gum arabic. Principal method depends on fact that dextrin and gum arabic yield furfural on distillation with 12% HCl.

Abstract in *Chem. abst.*, 1914, v. 8, p. 2080; *Jour. soc. chem. ind.*, 1914, v. 33, p. 433; *Chem. Zentr.*, 1914, Bd. 1, p. 1711.

1846. Bengen, F. Über die mikroskopische Untersuchung von Mehl und Backwaren, insbesondere über den Nachweis von Kar- toffelbestandteilen. (Zeitschrift für Unter- suchung der Nahrungs- und Genussmittel, Berlin, 1915, Bd. 29, p. 247-251.)

VTa
Potato starch is detected by its charac- teristic behavior when treated with Löffler's methylene blue solution, and when examined under polarized light.

Abstract in *Chem. abst.*, 1915, v. 9, p. 1809; *Chem. Zentr.*, 1915, Bd. 1, p. 1140.

1847. Blunck, Gustav. Kürzere Mitteilun- gen aus der Praxis. Ein neues Färbever- fahren für Kartoffelstärke. (Zeitschrift für Untersuchung der Nahrungs- und Genuss- mittel, Berlin, 1915, Bd. 29, p. 246-247.)

VTa
Finds the dye known as Metachrom Red G Agfa colors potato starch and cell tissues bright golden yellow but does not color cereal starches. Neutrality of the sample is essential.

Abstract in *Jour. soc. chem. ind.*, 1916, v. 35, p. 1077; *Jour. chem. soc.*, 1916, v. 110, part 2, p. 500; *Chem. Zentr.*, 1915, Bd. 1, p. 1139.

1848. Congdon, Leon. A concise group method for the detection of gelatinizing agents, pasty materials and thickeners, used in food products. (Journal of industrial and engineering chemistry, Easton, 1915, v. 7, p. 606-607.)

VOA
Identifies starch and its dextrins by iodine reaction of aqueous extract.

1849. Hanausek, T. F. Zur Mikroskopie der Stärke im Mischbrot. (Archiv für Chemie und Mikroskopie, Wien, 1915, Jahrg. 8, p. 72-78.)

Available in Library of the Chemists' Club.

Was able to identify microscopically the starches found in the various war breads after baking. The use of stains for the identification is not advisable. — *Chem. abst.*

1850. Lingelsheim, A. Der Nachweis von Kartoffelzusatz im Kriegsbrot. (Zeitschrift für Untersuchung der Nahrungs- und Ge- nussmittel, Berlin, 1915, Bd. 29, p. 361-368.)

VTa
Potato starch is identified by its charac- teristic appearance under the microscope

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and by its behavior towards polarized light.

Abstract in *Chem. abst.*, 1915, v. 9, p. 2272; *Chem. Zentr.*, 1915, Bd. 2, p. 101.

1851. Neumann, M. P. Über die Verwendung der Kartoffel bei der Brotbereitung. (Deutsche pharmaceutische Gesellschaft, Berichte, Berlin, 1915, Jahrg. 25, p. 131-141.)

Available in Library of Columbia College of Pharmacy.

Discusses the detection and estimation of potato starch.

Abstract in *Chem. Zentr.*, 1915, Bd. 2, p. 37.

1852. Schuetz, G., and L. WEIN. Mikroskopischer Nachweis v. Kartoffelstärke im Brot. (Chemiker-Zeitung, Cöthen, 1915, Jahrg. 39, p. 143.) ††VOA

Potato starch is distinctly stained when treated with neutral red, methylene blue, vesuvium or thionine, while wheat and rye starch remain colorless.

Abstract in *Chem. abst.*, 1915, v. 9, p. 1950; *Jour. soc. chem. ind.*, 1915, v. 34, p. 373; *Chem. Zentr.*, 1915, Bd. 1, p. 766.

1853. Sigmond, A. von, and J. TRAMBICS. Determination of maize flour in admixture with wheat flour. (Abstract.) (Society of Chemical Industry, Journal, London, 1915, v. 34, p. 1026.) VOA

Complementary mixtures of ungelatinized maize and wheat starch were warmed with malt extract for 2 hours at 65° and the concentration of the solution determined by means of the Zeiss immersion refractometer.

Also abstracted in *Chemiker-Zeitung*, Cöthen, 1915, Jahrg. 39, p. 636.

1854. Guilliermond, A. Sur une méthode permettant de colorer dans la cellule végétale les grains d'amidon au sein des mitochondries. 2. (Société de biologie, Comptes rendus, Paris, 1916, tome 79, p. 806-809.)

QAA

Details method of Champy and Kull.

Abstract in *Chem. abst.*, 1918, v. 12, p. 816.

1855. Heiduschka, A., and H. BAUCH. Über die Erkennung von Klebstoffen auf Briefen. (Zeitschrift für öffentliche Chemie, Plauen, 1916, Jahrg. 22, p. 193.) PKA

Agitate about 0.5 sq. cm. of the paper containing the adhesive with 1 cc. of lukewarm water, cool, and test with lead acetate for vegetable gums; with KI-I solution for starch products (starch paste gives a blue, most of the commercial dextrins a wine-red color); and with tannin solution for glue. — *Chem. abst.*

1856. Sperlich, Adolf. Jod, ein brauchbares mikrochemisches Reagens für Gerbstoffe, insbesondere zur Darstellung des Zusammenhanges der Verteilung von Gerbstoff und Stärke in pflanzlichen Geweben. (Deutsche botanische Gesellschaft, Berichte, Berlin, 1917, Jahrg. 35, p. 69-73.)

Available in Library of Columbia University.

Abstract in *Chem. Zentr.*, 1917, Bd. 1, p. 976.

1857. Unna, Eugen. Mikroskopisch-farberischer Nachweis von Weizen-, Roggen- und Kartoffelstärke nebeneinander. (Zeitschrift für Untersuchung der Nahrungs- und Genussmittel, Berlin, 1918, Bd. 36, p. 49-53.) VTA

The color combination calls for three basic dyes and one acid dye. Also, a fairly accurate quantitative estimate of the three starches in the presence of each other can be made by the use of a counting apparatus.

Abstract in *Chem. abst.*, 1919, v. 13, p. 1105; *Chem. Zentr.*, 1918, Bd. 2, p. 1083; *Bull. assoc. chimistes*, 1919-20, tome 37, p. 476-477.

1858. Haberlandt, G. The digestibility of potato starch. (Abstract.) (Chemical abstracts, Easton, 1919, v. 13, p. 1503.) PKA

Microscopic observation of the action of saliva on wheat, rye and potato starch grains.

1859. Herter, W. Zur quantitativen Mikroanalyse der Nahrungs- und Futtermittel. (Zeitschrift für Untersuchung der Nahrungs- und Genussmittel, Berlin, 1919, Bd. 38, p. 65-89.) VTA

An exhaustive study of the microscopic identification of starches, wood, cork, wax, fat, oil, cellulose, albumin and mineral matter and their quantitative estimation by comparison of size. Numerous tables and formulas are given. — *Chem. abst.*

1860. Burton, Alfred. Finishing materials and their identification. (Canadian chemical journal, Toronto, 1920, v. 4, p. 102-103.)

†VOA

Includes discussion on use of flour, starch, soluble starch, and dextrin. These substances are identified by the iodine reaction and by polarization.

1861. Amberger, K. Nachweis fremder Stärke im Getreidemehl. (Zeitschrift für Untersuchung der Nahrungs- und Genussmittel, Berlin, 1921, Bd. 42, p. 181-182.) VTA

Finds that at 58-59°, wheat, rye, barley and oat starches are readily saccharified by amylase, while maize, potato and bean starches remain unaffected and may be detected microscopically among the fragments

starches and Dextrins, continued.

action, Differentiation and Identification, continued.

issue in a flour; the small rice starch granules are also revealed in this way.

Abstract in *Chem. Zentr.*, 1922, Bd. 2, p. 96; *Chem. et industrie*, 1922, v. 8, p. 1304.

Bruhns, G. Über die Untersuchung Kunst- und Naturhonigen, Rübensirup usw. (*Chemiker-Zeitung*, Cöthen, Jahrg. 45, p. 661-664, 681-682, 685-711-712.) **†VOA**

p. 712 notes that dextrins formed from starch products are more slowly hydrolyzed than the condensation products in sugar solutions. This fact is used as a method for detecting adulteration by starch products.

Abstract in *Chem. abst.*, 1922, v. 16, p. 444-445.

Desvergnès, Louis. Note sur un traitement chimique des farines de maïs et de riz. (*Annales de chimie analytique*, Paris, 1921, année 26, p. 205-206.) **PKA**

The sample is boiled for 5 minutes with dilute HCl and filtered. Cassava and rice flour give a red filtrate, while oat, maize, barley and rye flours give yellow shades of yellow.

Abstract in *Chem. abst.*, 1921, v. 15, p. 3880.

Fresenius, W., and L. GRÜNHUT. Beiträge zur chemischen Analyse des Rohrzuckers. (*Zeitschrift für analytische Chemie*, 1921, Bd. 60, München-Wiesbaden, 1-187.) **PKA**

Nachweis fremder rechtsdrehender Substanzen, insbesondere des unreinen Stärkerückstands durch Polarisation. 2. Nachweis von Rohrzucker in Arabischem Gummi und Dextrinen.

Abstract in *Jour. soc. chem. ind.*, 1921, v. 40, p. 2219.

Vogt, E. Nachweis und Bestimmung von Starchemitteln in Mehl und Brot. (*Zeitschrift für Untersuchung der Nahrungsmittel*, Berlin, 1921, Bd. 42, p. 1-23.) **VTA**

Number of adulterants of wheat flour identified by the microscopical characters of the starch granules. Their recognition is facilitated by staining with a solution of Congo-red in India ink. Describes a method for determining "true starch content" of the ash, i.e. alkalinity after removing for alkalinity due to P_2O_5 . From these values a fairly quantitative estimate of proportions of the various flours may be gained.

Abstract in *Jour. soc. chem. ind.*, 1922, v. 41, p. 2219; *Chem. abst.*, 1922, v. 16, p. 593; *Chem. Zentr.*, 1922, Bd. 2, p. 97; *Chimie et industrie*, 1922, v. 8, p. 1304.

1866. The Testing of gum arabic for adulteration. (*Chemical abstracts*, Easton, 1922, v. 16, p. 349.) **PKA**

After precipitation of gum arabic from aqueous solution by $FeCl_3$, dextrin may be identified by its reducing power.

1867. Wallis, T. E. Some characteristics of wheat starch. (*Pharmaceutical journal and pharmacist*, London, 1922, v. 109, p. 82-83.)

Available in Library of the New York Academy of Medicine.

Details quantitative microscopic method for determining amounts of wheat and barley starches in presence of each other. Method based on fact that diameters of some wheat starch grains exceed 40μ .

Abstract in *Chem. abst.*, 1922, v. 16, p. 4086; *Chem. Zentr.*, 1922, Bd. 4, p. 676.

1868. Borries, Georg. Zur Entwicklung der Honiganalyse. (*Zeitschrift für angewandte Chemie*, Leipzig, 1923, Jahrg. 36, p. 352-353.) **PKA**

The detection of starch dextrins in honey is included in the discussion.

1869. Huebner, J., and K. VENKATARAMAN. The behaviour of different starches towards dyestuffs and iodine. (*Oil and color trades journal*, London, 1925, v. 68, p. 1891.) **†VOP**

Printed in further detail in *Society of Dyers and Colourists, Journal*, Bradford, 1926, v. 42, p. 110-121, **†VLG**.

1870. Calvino, E. M. Microchemical methods for distinguishing between glycogen and dextrin. (Abstract.) (*Chemical abstracts*, Easton, 1925, v. 19, p. 1146.) **PKA**

With a 0.5% solution of "Orseillin BB" in 90% alcohol, glycogen gives a red coloration, while erythrodextrin gives no coloration.

Also abstracted in *Chem. Zentr.*, 1924, Bd. 1, p. 2219.

1871. Chodat, R., and others. The specificity of starches. (Abstract.) By R. Chodat, J. W. Ross and M. Philia. (*Chemical abstracts*, Easton, 1925, v. 19, p. 2756.) **PKA**

Apart from microscopic differences, starches from various sources have been shown to exhibit different behavior during diastatic action, leading to the conclusion that there are differences in the degree of polymerization in the "amylose" and "amylopectin" present.

1871A. Ziegenspeck, H. Starch. (Abstract.) (*Chemical abstracts*, Easton, 1926, v. 20, p. 1647.) **PKA**

"Differences in the digestibility of starch from different sources by the same diastase may be due to chemical differences of the

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starches, which, in turn may be due either to differences in structure of the starch grain or merely to closer packing of the individual particles. The permeability for diastase of the plasma layers immediately surrounding the starch grain plays an important role in digestibility."

1871B. Mehta, M. M. Histological studies of the polysaccharides and aromatic constituents of the cell wall. (*Biochemical Journal*, London, 1925, v. 19, p. 979-997.) **PPB**

From the cell walls has isolated amylo-

hemicellulose, hemicellulose and starch and has determined their staining capacity.

1871C. Tadokoro, Tetsutaro, and others. Differences of the physico-chemical properties of the protein, oryzanin, as found in glutinous and in common rice. By Tetsutaro Tadokoro, Yukihiko Nakamura and Shukichi Watanabe. (*Hokkaido Teikoku Daigaku, Sapporo.—College of Agriculture, Journal*, 1925, v. 14, p. 129-169.) **VPG**

The differences in the starches of glutinous and common rice are attributed on biochemical grounds to differences in the main protein of rice, oryzanin.

Abstract in *Chem. abst.*, 1926, v. 20, p. 2334.

DETERMINATIONS IN VARIOUS MATERIALS

1872. Fuerstenberg, M. Analyse des Roggens und der Weizenkleie. (*Journal für praktische Chemie*, Leipzig, 1844, Bd. 31, p. 195-196.) **PKA**

Finds that starches of cereals contain dextrin similar to that obtained by the action of dilute acid or by diastase on starch, and that it is without reducing action on copper solutions.

Reprinted in *Annalen der Chemie und Pharmacie*, 1844, Bd. 52, p. 417-419, **PKA**.

1873. Krockner. Bestimmung des Stärkemehlgehaltes in vegetabilischen Nahrungsmitteln. (*Annalen der Chemie und Pharmacie*, Leipzig, 1846, Bd. 58, p. 212-227.) **PKA**

Lists the principal amylaceous cereals and their starch content. Starch is estimated by hydrolyzing with dilute H_2SO_4 , fermenting the resulting glucose and determining the amount of CO_2 evolved.

Abstract in *Rapport annuel sur les progrès de la chimie*, Berzelius, 1848, année 8, p. 231-233; *Jour. prakt. Chem.*, Erdmann's, 1846, Bd. 38, p. 489-492.

1874. Chevallier, Jean-Baptiste. Falsification du sucre par la fécule. (*Journal de chimie médicale*, Paris, 1848, série 3, tome 4, p. 276-279.)

Available in Library of the Surgeon General's Office.

Finds 12% starch in an adulterated sample of sugar.

1875. Dareste. Die Anwesenheit von Stärkemehl in Eigelb. (Auszug.) (*Jahresbericht der Chemie*, Giessen, 1873, p. 828.) **PKA**

1876. Boussingault. Analyses comparées du biscuit de gluten et de quelques aliments féculents. (*Annales de chimie et de physique*, Paris, 1875, série 5, tome 5, p. 114-128.) **PAA**

Includes starch determinations for a number of food materials.

1877. Muter. Notes on a classification of the chief starches existing in, or added to, articles of food and drugs to facilitate their detection. (*Analyst*, London, 1877, v. 1, p. 172-174.) **PKA**

Gives measurement and description of granules of about 50 starches at a magnification of 230 diameters.

1878. Krauch, C. Ueber den Nachweis einiger hauptsächlichen Surrogate im gemahlten Caffee. (*Deutsche chemische Gesellschaft, Berichte*, Berlin, 1878, Jahrg. 11, p. 277-283.) **PKA**

Discusses presence of starch.

1879. Kellner, O. Die Zusammensetzung einiger als menschliche Nahrungsmittel in Verwendung stehenden japanischen landwirtschaftlichen Produkte. (*Landwirtschaftlichen Versuchs-Stationen*, Berlin, 1884, Bd. 30, p. 42-51.)

Available in Library of the Department of Agriculture.

Notes percent starch in a number of Japanese foodstuffs.

Abstract in *Jour. chem. soc.*, 1884, v. 46, p. 674-677; *Chem. Centr.*, 1884, p. 266-267.

1880. Beutell, A., and F. W. DAFERT. Ueber die Zusammensetzung der Klebhirse (*Panicum miliaceum* var. *Bretschneideri* Ktze). (*Chemiker-Zeitung*, Cöthen, 1887, Jahrg. 11, p. 136.) **†† VOA**

The adhesive properties of gluten millet are attributed to the presence of erythromylum.

Abstract in *Chem. Centr.*, 1887, p. 245.

1881. Ladd, E. F. Sugars and starch in fodders and their determination. (*American chemical journal*, Baltimore, 1888, v. 10, p. 49-53.) **PKA**

Saccharifies with dilute HCl and determines the sugar with Fehling's solution.

ches and Dextrins, continued.

terminations in Various Materials, cont'd.

ults are given for a number of feed-

stract in *Jour. soc. chem. ind.*, 1889, v. 8, p. 1013; *Chem. Centr.*, 1888, p. 1013.

Pinchon, A. Contribution à l'examen poivres. (*Revue internationale des falsifications*, Paris, 1889, année 3, p. 21-22.)

† VTD

arch is sometimes present as an adul-

stract in *Chem. Centr.*, 1889, Bd. 2, p. 946.

Bau, Arminius. Ueber die schein-Zunahme des Dextringehaltes in Bier- en während der Gährung. (*Wochen- ft für Brauerei*, Berlin, Jahrg. 7, 1890, 0-711, 1069-1074.)

available in Library of the Brewers' emy.

stract in *Wag. Jahr.*, 1890, Jahrg. 36, p. 1006.

Bourquelot, Em. Sur la présence de don dans un champignon appartenant famille des Polyporées. (*Journal de nacie et de chimie*, Paris, 1891, série 5, 24, p. 197-199.)

available in Library of Columbia Collegearmacy.

Rideal, S., and W. E. YOULE. Gum and its modern substitutes. (*Society chemical Industry, Journal*, London, v. 10, p. 610-622.)

VOA

esence of starch in gums is taken up.

Jalowetz, Ed. Ueber die präexisten Kohlehydrate des Malzes. (Abge-.) (*Chemisches Repertorium*, Cöthen, Jahrg. 18, p. 39.)

†† VOA

es not find iso-maltose in the alcoholic ueous extract of malt. Is uncertain as ether dextrin is originally present or is d during extraction. Notes the pres- of a dextrose-forming enzyme in malt.

tract in *Jour. soc. chem. ind.*, 1894, v. 13, p. 675; *Chem. Centr.*, 1894, Bd. 1, p. 675.

Kuennmann, O., and A. HILGER. Zur ie des Honigs. (*Forschungs-Berichte Lebensmittel*, München, 1896, Jahrg. 11-226.)

ilable in Library of the Department riculture.

dextrin was prepared from honey was identical in properties with the dextrans of Lintner and of Mittel-

tract in *Jour. chem. soc.*, 1897, v. 72, part 1, 394; *Chem. Centr.*, 1896, Bd. 2, p. 476-478.

Storer, F. H. Observations on some chemical substances in the trunks of

trees. (Harvard University, *Bulletin of the Bussey Institute*, 1897, v. 2, part 6, p. 386-408.)

Available in Library of the Department of Agriculture.

Includes methods of starch determination and results obtained for woods at various periods.

Abstract in *Jour. soc. chem. ind.*, 1897, v. 26, p. 1049.

1889. Tanret, Charles. Action des nitrate, sulfate, chlorhydrate et phosphate d'ammoniaque sur l'aspergillus niger. (*Société chimique de Paris, Bulletin*, Paris, 1897, série 3, tome 17, p. 914-921.)

PKA

Starch in aspergillus niger is determined colorimetrically, after first solubilizing with acids. The starch is further identified by its rotatory power and its conversion to dextrose.

Abstract in *Jour. chem. soc.*, 1899, v. 76, part 2, p. 170.

1890. Frehse. Sur l'emploi d'un produit nouveau derive de l'amidon dans les confitures et les cremes. (*Annales de chimie analytique*, Paris, 1901, tome 6, p. 210-211.)

PKA

A mixture used for making blanc manges, etc., was found to contain sugar and flavoring matter, with 8.5% wheat starch.

Abstract in *Jour. chem. soc.*, 1901, v. 80, part 2, p. 536; *Chem. Centr.*, 1901, Bd. 2, p. 319; *Bull. soc. chim. Paris*, 1901, série 3, tome 25, p. 658.

1891. Gilson, E. Quelle fécule convient-il d'ajouter à la margarine comme substance révélatrice? (*Société chimique de Belgique, Bulletin*, Bruxelles, 1904, année 18, p. 93-94.)

PKA

Suggests that a foreign starch be used in order to facilitate characterization.

Abstract in *Chem. Centr.*, 1904, Bd. 2, p. 56.

1892. Rusting, Gullow. Absence de l'amidon dans la graine de lin. (Extrait.) (*Répertoire de pharmacie*, Paris, 1907, série 3, tome 19, p. 122-123.)

Available in Library of the New York Academy of Medicine.

Numerous examinations failed to indicate the presence of starch grains in flaxseed, though the cellular membrane of certain tissues of the seed gave a blue color with iodine. Several hundred examinations gave a negative result. The starch frequently found in linseed meal must arise from an admixture of foreign seeds.

1893. Bryan, T. J. The carbon dioxide value of pure compressed yeast and compressed yeast and starch compounds. (United States.—Bureau of Chemistry,

*Starches and Dextrins, continued.**Determinations in Various Materials, cont'd.*

Washington, 1907, Bulletin no. 116, p. 25-28.) **VPH**

Concludes that starch does not improve the keeping quality of yeast and is to be considered as an adulteration.

Abstract in *Chem. abst.*, 1909, v. 3, p. 555.

1894. Grélot, P. Sur la présence normale d'amidon dans la moutarde préparée pure. (Bulletin des sciences pharmacologiques, Paris, 1908, tome 15, p. 210-213.)

Available in Library of the Surgeon General's Office.

Abstract in *Chem. abst.*, 1910, v. 4, p. 354; *Chem. Zentr.*, 1908, Bd. 1, p. 2045.

1895. Peklo, Jaroslav. Über stärkehaltige Zuckerrüben. (Zeitschrift für Zuckerindustrie in Böhmen, Prague, 1908-09, Jahrg. 33, p. 438-446.)

Available in Library of the Department of Agriculture.

States that the appearance of starch in sugar beets is a frequent occurrence.

Abstract in *Chem. abst.*, 1909, v. 3, p. 1477; *Chem. Zentr.*, 1909, Bd. 1, p. 1587.

1896. Collin, Eugène. Falsification des confitures par les produits dérivés de l'amidon. (Annales des falsifications, Paris, 1909, année 2, p. 127-130.) **VTD**

1897. Dagousset. Les matières amylacées dans la fabrication de la moutarde. (Annales des falsifications, Paris, 1909, année 2, p. 126.) **VTD**

1898. Grélot, P. A propos de la présence normale d'amidon dans la moutarde préparée. (Annales des falsifications, Paris, 1909, année 2, p. 405-407.) **VTD**

Continuation of the controversy upon the presence of starch in mustard. The writer is of the opinion that it is often found in the immature grains. The effect of acetic acid upon detection is also discussed.—*Chem. abst.*

Abstract in *Chem. Zentr.*, 1910, Bd. 1, p. 1282.

1899. Carles, P. Sur le dosage des matières amylacées dans les produits de la charcuterie. (Annales de chimie analytique, Paris, 1911, tome 16, p. 89-90.) **PKA**

A number of results are given.

Abstract in *Chem. abst.*, 1911, v. 5, p. 1945; *Chem. Zentr.*, 1911, Bd. 1, p. 1326.

1900. Thomson, W. Determination of indigotin in the presence of starch. (Society of Dyers and Colourists, Journal, Bradford, 1911, v. 27, p. 49-52.) **† VLG**

Compares several methods.

Abstract in *Jour. soc. chem. ind.*, 1911, v. 30, p. 411; *Jour. chem. soc.*, 1911, v. 100, part 2, p. 346; *Chem. abst.*, 1912, v. 6, p. 297.

1901. Frank, G. H., and A. G. PERKIN. The analysis of indigos containing starch. (Society of Chemical Industry, Journal, London, 1912, v. 31, p. 372-373.) **VOA**

Find that starch may be completely removed by boiling for 30 minutes with 4% HCl. Recommend that the indigo should then be estimated by Bloxam's method.

1902. Roberts, Charles C. Determination of sucrose in confectionery containing cooked starch and in marshmallows. (Abstract.) (International Congress of Applied Chemistry, 8th, Washington and New York, 1912, Original communications, v. 25, p. 539.) **PKR**

Abstract in *Chem. abst.*, 1912, v. 6, p. 3478.

1903. Collin, Eugène. Les confitures. (Annales des falsifications, Paris, 1913, année 6, p. 629-638.) **VTD**

Discusses causes for presence of starch in preserves, and also the very close similarity of buckwheat and chestnut starches.

Abstract in *Chem. Zentr.*, 1914, Bd. 1, p. 568; *Chem. abst.*, 1914, v. 8, p. 3825.

1904. Tschirch, A., and H. SCHKLOWSKY. Studien über die Macis. (Archiv der Pharmacie, Berlin, 1915, Bd. 253, p. 102-109.)

Available in Library of Columbia College of Pharmacy.

Notes the presence of amylopectin starch in mace.

Abstract in *Chem. abst.*, 1916, v. 10, p. 87; *Chem. Zentr.*, 1915, Bd. 2, p. 195.

1905. Haupt. Über das Vorkommen von Stärke in Marmeladen. (Zeitschrift für Untersuchung der Nahrungs- und Genussmittel, Berlin, 1916, Bd. 32, p. 411-412.) **VT A**

Abstract in *Chem. abst.*, 1917, v. 11, p. 674.

1906. Remington, Roe R. Results of questionnaire on starch in canned food. (Canning trade, Baltimore, 1916, v. 38, p. 18-22.) **† VTD**

Reprinted in *The Canner*, Chicago, 1916, v. 43, no. 6, Aug. 10, p. 36-40, **† VTD**.

1907. Pammel, L. H., and ARTHUR W. DOX. The protein content and microchemical tests of the seeds of some common Iowa weeds. (Iowa Academy of Science, Proceedings, Des Moines, 1917, v. 24, p. 527-532.) *** EA**

Includes results of microchemical tests for starch, protein and fat on over 100 species.

Abstract in *Chem. abst.*, 1918, v. 12, p. 1066.

1908. Falk, K. George. The carbohydrates of fresh and dehydrated vegetables. (*Jour-*

es and Dextrins, continued.

inations in Various Materials, cont'd.

industrial and engineering chemistry, n, 1919, v. 11, p. 1133.)

VOA

ples were analyzed for reducing, dextrin and soluble starch before ter dehydration. Results indicate no e in the carbohydrate distribution.

Gerum, J. Über den Ausmahlungs-er Mehle. (Zeitschrift für Untersucher Nahrungs- und Genussmittel, Ber-19, Bd. 37, p. 145-157.)

VTA

milling grade of flour can be ascer-from the starch content on air-dry al; starch is determined by Ewer's netric method.

act in *Chem. abst.*, 1920, v. 14, p. 81; *Chem.* 1919, Bd. 4, p. 674.

— Über den Stärkegehalt von locken. (Zeitschrift für Untersucher Nahrungs- und Genussmittel, Ber-19, Bd. 37, p. 157-159.)

VTA

ral samples of Quaker Oats showed contents ranging from 45 to 62%.

act in *Chem. Zentr.*, 1919, Bd. 4, p. 675.

Wissell, von. Über die chemische umung der Stärke in verschiedenen arten und einigen anderen Pflanzen-. (Landwirtschaftliche Jahrbücher, 1919, Bd. 53, p. 617-625.)

VPA (Prussia)

g the polarimetric method of Ewers, rch content for various prunings var-n 3.5 to 7.5%. The method of Reinke t suitable because of hydrolysis of urchy material.

Dox, Arthur W., and LESTER YODER. ce of fermentation on the starch e of experimental silage. (Journal of rual research, Washington, 1920, v. 173-179.)

VPZ (U. S. Agriculture)

g the polarimetric method of Porst own, the starch content of corn was found to remain approximately t over a period of 90 days.

ct in *Chem. abst.*, 1920, v. 14, p. 2958.

Friedemann, W. G. The carbohy- of the pecan. (American Chemical Journal, Easton, 1920, v. 42, p. 88.)

PKA

ts the absence of starch in pecan

Jacobs, B. R., and O. S. RASK. ory control of wheat flour milling. l of industrial and engineering y, Easton, 1920, v. 12, p. 899-903.)

VOA

hat the amount of starch contained t or any mill product is a measure

of the amount of inner endosperm and, therefore, of the amount of flour contained in that product.

1915. Kalning, H., and A. SCHLEIMER. Vergleichende Zucker- und Dextrinbestim-mungen im Mehl, Teig und Gebäck. (Aus-zug.) (Chemisches Zentralblatt, Berlin, 1920, Bd. 2, p. 342.)

PKA

Find a remarkably low dextrin content in bread crust and biscuits. The strong brown-ing is attributed to caramelization.

Abstract in *Chem. Zentr.*, 1920, Bd. 2, p. 342.

1916. Kempton, J. H. Erythrodextrin in maize. (Science, New York, 1923, v. 57, p. 556-557.)

OA

Discusses recent paper of Weatherwax.

1917. Sherwood, Sidney F. Starch in sorg-hum juice. (Industrial and engineering chemistry, Easton, 1923, v. 15, p. 727-728.)

† **VOA**

Starch, sucrose, and reducing sugars con-tents of the expressed juice of 15 varieties of sorghum at time of maturity are given. The probable effect of starch upon filtration of juice, consistency of sirup, and crystal-lization of sucrose is briefly discussed.

Abstract in *Jour. soc. chem. ind.*, 1923, v. 42, p. 849A.

1918. — Jellying of sorghum sirup.— Effect of malt diastase upon the filtration of sorghum juice. (Industrial and engineer-ing chemistry, Easton, 1923, v. 15, p. 780-782.)

VOA

Results from 9 series of determinations show that starch is largely responsible for the jellying of sorghum sirup and for the extreme difficulty in filtering sorghum juice, especially after it has been heated. Preliminary treatment of the juice with malt diastase greatly increases the rate of filtration and prevents the "jellying" of the finished sirup.

1919. Hooker, Henry D. Changes pro-duced in apple trees by various types of pruning. (Missouri.—Agricultural Experi-ment Station, Research bulletin, Columbia, 1924, v. 72, 11 p.)

VPG

Starch was determined in the trees before and after pruning.

1920. Miyake, Suguru. Chemical studies of maize pollen. 2. Carbohydrates and or-ganic bases. (Journal of biochemistry, To-kyo, 1924, v. 3, p. 169-176.)

Available in Library of the Chemists' Club.

Notes the presence of starch.

1921. Perrier, G. Présence normale d'ami-don dans les jus pectiques employés en

Starches and Dextrins, continued.

Determinations in Various Materials, cont'd.

confiturerie. (Annales des falsifications et des fraudes, Paris, 1924, année 17, p. 208-211.) **VTD**

Pectin juices from bruised or immature fruit invariably contain a certain amount of starch. As much as 0.4% starch has been found in commercial pectin solutions prepared from dried apple cores. Starch is determined colorimetrically by comparing with known starch solutions treated with I.

Abstract in *Chem. abst.*, 1924, v. 18, p. 2390; *Chem. Zentr.*, 1924, Bd. 2, p. 1292.

1922. Willaman, J. J., and F. R. DAVISON. Starch in sorghum sirup. (Industrial and

engineering chemistry, Easton, 1924, v. 16, p. 609-610.) **VOA**

The sirups were diluted, the "crude gum" precipitated by alcohol, and starch in the gum determined by the diastase method. Results show 0.3-1.1% starch in normal sirups, and 1.1-3.3% in sirups which tend to gel. Corn stalk sirup is free from starch.

1923. Widmer, A., and O. KALBERER. Versuche und Untersuchungen bezüglich des Vorkommens von Stärkekörnern im Weintrub bei verschiedener Art der Weinherstellung zwecks Nachweis von Obstwein in Wein. (Auszug.) (Chemisches Zentralblatt, Leipzig und Berlin, 1925, Bd. 2, p. 250.) **PKA**

ANALYTICAL EXAMINATION

1924. Payen, A., and PERSOZ. Sur les proportions d'eau que recèlent les féculs et les farines commerciales. (Journal de chimie médicale, Paris, 1833, tome 9, p. 210-212.)

Available in Library of the Surgeon General's Office.

Have determined proportions of water and dry material in starches which have been exposed to various degrees of humidity.

Abstract in *Journal für technische und ökonomische Chemie*, Leipzig, 1833, Bd. 17, p. 221-222.

1925. Boettger, R. Einfaches Mittel, wodurch man erkennen kann, ob Stärkemehl kleberhaltig ist, oder nicht. (Journal für praktische Chemie, Leipzig, 1837, Bd. 10, p. 110-111.) **PKA**

A thick starch paste is heated to boiling and stirred vigorously. Starches which contain traces of gluten develop a thick scum, which is not the case with starches free from gluten.

Abstract in *Annalen der Pharmacie*, Liebig's, 1837, Bd. 24, p. 255-256.

1926. Koechlin, Karl. Ueber Prüfung der im Handel vorkommenden Mehl- und Stärkmehlarten, sowie ihrer Gemenge mittelst Jod. (Dingler's polytechnisches Journal, Stuttgart, 1851, Bd. 120, p. 364-367.) **3-VA**

1927. Wolff, Justus. Untersuchung der verschiedenen im Handel vorkommenden Stärkesorten. (Journal für praktische Chemie, Leipzig, 1857, Bd. 71, p. 86-97.) **PKA**

Examined the proportions of water and the ash constituents of a number of starches.

Condensed in *Wag. Jahr.*, 1857, Jahrg. 3, p. 225-232.

Abstract in *Chem. Centr.*, 1857, p. 764-766.

1928. Vogel, August. Über die Verschiedenheit der Asche in den einzelnen Bestandteilen der Kartoffel. (Neues Repertorium für Pharmacie, Buchner's, München, 1866, Bd. 15, p. 1-3.)

Available in Library of the Surgeon General's Office.

Duplicate abstracts in *Chem. Centr.*, 1866, p. 831-832; *Wag. Jahr.*, 1866, Jahrg. 12, p. 371-373.

1929. Lindenmeyer, G. Ueber fremde Bestandtheile im käuflichen Stärkemehl. (Dingler's polytechnisches Journal, Augsburg, 1868, Bd. 189, p. 131-135.) **3-VA**

Determines amount of sugars, lactic acid and other soluble materials.

Abstract in *Wag. Jahr.*, 1868, Jahrg. 14, p. 433.

1930. Scheibler, C. Ueber ein einfaches Verfahren, den procentischen Wassergehalt der verschiedenen Stärkemehlsorten zu bestimmen. (Deutsche chemische Gesellschaft, Berichte, Berlin, 1869, Jahrg. 2, p. 170-173.) **PKA**

Water in the sample is absorbed by alcohol, and from the specific gravity of the alcohol before and after absorption the percent water is calculated. Gives results of 11 determinations and also table for calculation.

Reprinted in *Wag. Jahr.*, 1869, Jahrg. 15, p. 387-390.

Abstract in *Chem. news*, 1869, v. 19, p. 297; *Bull. soc. chim. Paris*, 1870, nouv. série, tome 13, semestre 1, p. 92-93; *Polytechnisches Notizblatt*, 1869, Jahrg. 24, p. 337-338.

1931. Starch and its adulterations. (Scientific American, New York, 1869, new series, v. 21, p. 186-187.) **†† VA**

1932. Coster, D. J. Stärkemehl. (Auszug.) (Chemisches Central-Blatt, Leipzig, 1871, p. 149.) **PKA**

Investigated a starch which was adulterated with sugar.

ses and Dextrins, continued.

tical Examination, continued.

Stärkemehl-Produkte. (Muster-Zei-
Berlin, 1871, Jahrg. 20, p. 158-159.)

† 3-VLA

examined various commercial dex-

tract in *Chem. Centr.*, 1871, p. 370.

Falsifications of Belgian starch. (Ab-
) (American chemist, Philadelphia,
3, v. 3, p. 468.)

PKA

tarch sold under the name of "rice"
" was found to contain potato starch
% plaster.

Adulterated starch in Paris. (Ab-
) (American chemist, Philadelphia,
v. 3, p. 200.)

PKA

ount of recent legal controversies reg-
g the adulteration of rice starch with
starch and plaster of Paris.

Barfoed, C. Ueber die Nachweisung
raubenzuckers neben Dextrin u. ver-
en Körpern. (Zeitschrift für analy-
Chemie, Wiesbaden, 1873, Jahrg. 12,
32.)

PKA

tract in *Chem. Centr.*, 1873, p. 357.

— Ueber Dextrin. (Journal für
sche Chemie, Leipzig, 1873, N. F.,
p. 334-342.)

PKA

ll quantities of glucose may be de-
in the presence of dextrin by means
per acetate. The presence of glucose
wn by the formation of red cuprous
Finds pure dextrin is fermentable.

ensed in *Wag. Jahr.*, 1873, Jahrg. 19, p. 638-

tract in *Bull. soc. chim. Paris*, 1873, nouv.
me 19, semestre 1, p. 457; *Chem. Centr.*,
100; *Jahresber. Chem.*, 1872, p. 771-773;
n chemist, New York, 1872-73, v. 3, p. 388.

Bondonneau, Lucien. Dosage de
lité des matières amylacées. (Acadé-
s sciences, Comptes rendus, Paris,
me 98, p. 153-155.)

*EO

ts out an error caused by presence
acids. Recommends that dilute am-
n hydroxide be added before drying
terial.

act in *Jour. chem. soc.*, 1884, v. 46, p. 927;
Centr., 1884, p. 198; *Jahresber. Chem.*, 1884, p.

Saare, Oscar. Zur Bestimmung des
gehaltes der Stärke durch Trock-
zeitschrift für Spiritusindustrie, Ber-
4, N. F., Jahrg. 7, p. 595-596.)

able in Library of the Patent Office.
usses recent article of Bondonneau.
ct in *Wag. Jahr.*, 1884, Jahrg. 30, p. 741.

**Ueber die Herstellung und Unter-
g von Stärke.** (Dingler's polytech-

nisches Journal, Stuttgart, 1885, Bd. 255, p.
209-213.)

3-VA

Discussion.

Abstract in *Jour. soc. chem. ind.*, 1885, v. 4, p.
236.

1941. **Williams, Rowland.** On the exami-
nation and analysis of certain materials
used in dyeing and calico printing. (Society
of Chemical Industry, Journal, London,
1886, v. 5, p. 72-75.)

VOA

Includes briefly the examination of
starch.

1942. **Hanofsky, Carl.** Ueber die Unter-
suchung der Handelsdextrine. (Technolo-
gisches Gewerbe-Museum in Wien, Mit-
theilungen, Section für chemische Gewerbe,
1889, N. F., Jahrg. 3, p. 56-59.)

VA

Abstract in *Jour. soc. chem. ind.*, 1889, v. 8, p.
573; *Jahresber. Chem.*, 1889, p. 2461; *Wag. Jahr.*,
1889, Jahrg. 35, p. 871-872.

1943. **Saare, Oscar.** Ueber den Säurege-
halt der Kartoffelstärke. (Zeitschrift für
Spiritusindustrie, Berlin, 1889, N. F., Jahrg.
12, p. 306-307.)

Available in Library of the Patent Office.

1944. **Dickmann, F.** Stärkeverfälschung.
(Zeitschrift für angewandte Chemie, Ber-
lin, 1890, Jahrg. 3, p. 596.)

Available in Library of the Chemists'
Club.

Describes a sample of rice starch which
had been adulterated with PbSO₄.

1945. **Saare, Oscar.** Wasserbestimmung
in Stärke und Dextrin. (Zeitschrift für Spir-
itusindustrie, Berlin, 1890, N. F., Jahrg. 13,
p. 343.)

Available in Library of the Patent Office.

Abstract in *Wag. Jahr.*, 1890, Jahrg. 36, p. 819.

1946. — Zur Bestimmung des Wasser-
gehaltes der Kartoffelstärke. (Zeitschrift
für Spiritusindustrie, Berlin, 1891, N. F.,
Jahrg. 14, p. 153-154.)

Available in Library of the Patent Office.

Abstract in *Chem. Centr.*, 1891, Bd. 2, p. 94.

1947. **Reinke, Otto.** Analysen von Dex-
trinen. (Zeitschrift für Spiritusindustrie,
Berlin, 1892, N. F., Jahrg. 15, p. 144.)

Available in Library of the Patent Office.

Using several samples, determines water,
portion soluble at 15°, sugar, acidity, ash
and nature of acid present.

Abstract in *Jour. soc. chem. ind.*, 1893, v. 12, p.
168; *Chem. Centr.*, 1892, Bd. 1, p. 983; *Wag. Jahr.*,
1892, Jahrg. 38, p. 693.

1948. **La Recherche de la gomme mélange
à la dextrine.** (Extrait.) (Revue interna-

Starches and Dextrins, continued.

Analytical Examination, continued.

tionale des falsifications, Paris, 1892, année 6, p. 32-33.) †VTD

Gives requirements for a commercial dextrin.

Abstract in *Chem. Centr.*, 1892, Bd. 2, p. 941.

1949. Bloch. Recherches sur la dessiccation de la fécule. (Académie des sciences, Comptes rendus, Paris, 1894, tome 118, p. 146-149.) *EO

Finds a temperature of 160° is necessary for complete removal of water. Results are compared to those obtained by the Bloch feculometer.

Abstract in *Jour. chem. soc.*, 1894, v. 61, part 1, p. 161; *Chem. Centr.*, 1894, Bd. 1, p. 417.

1950. Cownley, A. J. "Starch-free" gluten preparations. (Pharmaceutical journal, London, 1898, v. 61, p. 327.)

Available in Library of the New York Academy of Medicine.

Some so-called "starch free" commercial mixtures, such as gluten flour, bran biscuits, gluten bread and gluten macaroni, showed percentages of starch ranging from 65.2 to 2.8.

Abstract in *Jour. soc. chem. ind.*, 1898, v. 17, p. 941.

1951. Hefelmann, Rudolf, and WINNY SCHMITZ-DUMONT. Zur Untersuchung stärkereicher Handelsdextrine. (Zeitschrift für öffentliche Chemie, Weimar, 1898, Jahrg. 4, p. 448-450.) VOA

Methods for determination of water, ash, dextrin, starch and sugar.

Abstract in *Jour. soc. chem. ind.*, 1898, v. 17, p. 960; *Chem. Centr.*, 1898, Bd. 2, p. 561; *Wag. Jahr.*, 1898, Jahrg. 44, p. 774.

1952. Saare, Oscar. Kartoffelstärke und Kartoffelmehl. (Leipziger Färber-Zeitung, Leipzig, 1899, Jahrg. 48, p. 323, 335-337.)

†VLA

Discusses classification according to diameter of granules, preparation of starch "crystals," physical characteristics of potato starch, presence of chlorine, determination of acidity and determination of water present.

Abstract in *Jour. soc. chem. ind.*, 1899, v. 18, p. 1038.

1953. — Die Weizen- und Maisstärke des Handels. (Zeitschrift für Spiritusindustrie, Berlin, 1901, N. F., Jahrg. 24, p. 502, 512-513.)

Available in Library of the Patent Office.

Has determined moisture, ash, albumenoids, fat and acidity in a large number of maize and wheat starches.

Abstract in *Jour. soc. chem. ind.*, 1902, v. 21, p. 129; *Wag. Jahr.*, 1901, Jahrg. 47, p. 274-275.

1954. Baland. Sur quelques farines ou féculs exotiques employées à l'alimentation. (Journal de pharmacie et de chimie, Paris, 1903, série 6, tome 17, p. 476-478.)

Available in Library of the New York Academy of Medicine.

Discusses the preparation and extent of application of a large number of foreign starches. Gives analyses of 15 flours and starches.

Abstract in *Jour. soc. chem. ind.*, 1903, v. 22, p. 707; *Chem. Centr.*, 1903, Bd. 1, p. 1431.

1955. Hoffmann, J. F., and J. H. SCHULZE. Die Wasserbestimmung in Hefe, Trebern, Hopfen und Stärke. (Wochenschrift für Brauerei, Berlin, 1903, Jahrg. 20, p. 217-218.) †VTRA

The starch sample is immersed in a mixture of turpentine and toluene and heated to 150°. The water driven off is collected and measured.

Abstract in *Jour. soc. chem. ind.*, 1903, v. 22, p. 655.

1956. Maquenne, Léon. Sur la dessiccation absolue des matières végétales. (Académie des sciences, Comptes rendus, Paris, 1905, tome 141, p. 609-612.) *EO

Studies the dessiccation of flour and starch. The water content when determined by heating an hour at 120° and 2 hours at 100° in a current of dry air, appears to be about 1% greater than when determined by ordinary methods.

Abstract in *Jour. chem. soc.*, 1906, v. 90, part 2, p. 129; *Bull. soc. chim. Paris*, 1906, série 3, tome 35, p. 256.

1957. Browne, C. A. Assay of commercial dextrins. (United States.—Bureau of Chemistry, Washington, Bulletin no. 116, 1907, p. 66-68.) VPH

Reports the analyses of 11 samples of dextrin giving the method for the separate determinations. The determinations made under physical constants are specific rotation and viscosity; under chemical analysis, moisture, ash, soluble starch, uncorrected starch, insoluble in cold water, reducing sugar, dextrin and undetermined solubles. —*Chem. abst.*

1958. Amidons. 153.—Definitions. 154.—Falsifications et contrefaçons. (Congresso internazionale di chimica applicata, 6th, Roma, 1907, [Proceedings], v. 7, p. 540-542.) PKR

Lists 38 starch terms.

1959. Hanow, H. Die vom Oktober 1907 bis jetzt untersuchten Kartoffelstärken, Kartoffelmehle und feuchten Stärken. (Zeitschrift für Spiritusindustrie, Berlin, 1908, Jahrg. 31, p. 403.) ††VTZA

es and Dextrins, continued.

ical Examination, continued.

Browne, C. A., and A. H. BRYAN. Analysis of commercial dextrins. (International Congress of Applied Chemistry, 7th, n, 1909, [Proceedings], section 5, p. 2.)

PKR
Describes methods for determination of spe-
tation, viscosity, moisture, ash, sol-
tarch, unconverted starch, reducing
and dextrin; gives results for 52
es analyzed in this way.

act in *Jour. soc. chem. ind.*, 1911, v. 30, p.
ll. *assoc. chimistes*, 1909-10, tome 27, p. 589.

Versammlung des Vereins der
-Interessenten in Deutschland zu
am 24. Februar 1910. (Chemiker-
g, Cöthen, 1910, Jahrg. 34, p. 256-
†† **VOA**
udes report on analyses, trade and
culture for the preceding year.

Reinke, Otto. Bestimmung der
auf Farbe, Glanz, Säure und Stippen.
iker-Zeitung, Cöthen, 1910, Jahrg.
193.)

†† **VOA**
starch is spread on a glass plate or
paper and examined.

act in *Chem. abst.*, 1911, v. 5, p. 1204.

Parow, Edmund. Jahresbericht des
der Stärke-Interessenten Deutsch-
(Chemiker-Zeitung, Cöthen, 1911,
35, p. 230-231.)

†† **VOA**
s results of 288 tests of potato starch
rch meals.

act in *Chem. abst.*, 1911, v. 5, p. 2199.

Zerewitinoff, T. Über die quantita-
stimmung des Wassers in verschied-
Substanzen mittels magnesiumhal-
organischer Verbindungen. (Zeit-
für analytische Chemie, Wiesbaden,
hrsg. 50, p. 680-691.)

PKA
sample is shaken with a pyridine
of methyl magnesium iodide and
thane, which is evolved, measured in
meter; two molecules of methane
t one of water. Using three
of starch, close checks are obtained
method and the usual vacuum dry-
nod.

act in *Chem. abst.*, 1912, v. 6, p. 203; *Jour.*
ind., 1911, v. 30, p. 1233; *Chem. Zentr.*,
2, p. 1482; *Bull. soc. chim. France*, 1912,
me 12, p. 703.

acker, F. H. Waterbepaling in
elzetmeel en tarwemeel. (Pharma-
weekblad, Amsterdam, 1912, jaarg.
45-1047.)

ble in Library of the Chemists'

it unnecessary to carry out a pre-
drying at 50°.

1966. Rolfe, George W. Notes on com-
mercial dextrins. (International Congress
of Applied Chemistry, 8th, Washington and
New York, 1912, Original communications,
v. 13, p. 237-245.)

PKR

In an analysis of 13 commercial samples,
finds no relation between specific rotation
and Cu reducing power. Dextrins are pre-
pared in the laboratory at varying tempera-
tures and with varying amounts of acid.
For these, it is shown that the specific ro-
tation decreases with continued heating,
while the cupric reducing power remains
practically constant.

Abstract in *Chem. abst.*, 1912, v. 6, p. 3033.

1967. Czadek, von, and others. Unter-
suchung der Handelsstärke. (Auszug.)
(Chemisches Zentralblatt, Berlin, 1913, Bd.
1, p. 658.)

PKA

Methods of valuation as developed in
Austrian agricultural experiment stations.

1968. Jacobsen, H. C. De samenstelling
van het zetmeel. (Chemisch weekblad, Am-
sterdam, 1913, jaarg. 10, p. 552-563.)

† 3-**VOA**

1969. Parow, Edmund. Abgekürzte Meth-
ode zur Bestimmung des Wassergehalts in
Kartoffelstärke und Kartoffelmehl. (Zeit-
schrift für Spiritusindustrie, Berlin, 1914,
Jahrg. 37, p. 401.)

†† **VTZA**

The starch is heated for an hour at 50°
and at 120°.

Abstract in *Chem. abst.*, 1914, v. 8, p. 3249.

1970. Ascertaining the value of starch
pastes. (Posselt's textile journal, Philadel-
phia, 1915, v. 17, p. 47.)

† **VLA**

1971. Moeser, Ludwig. Über den Eiweiss-
gehalt der Stärke und eine Methode der
Herstellung eiweissfreier Stärkepräparate.
(Zeitschrift für Hygiene und Infektions-
krankheiten, Leipzig, 1917, Bd. 83, p. 113-
116.)

Available in Library of the New York
Academy of Medicine.

Finds that various commercial starches
contain 0.03-0.7% nitrogen. A method is de-
scribed for preparing nitrogen free starches.
The method depends on the protein dis-
solving action of alcoholic KOH or NaOH,
which does not attack starch.

Abstract in *Chem. Zentr.*, 1917, Bd. 1, p. 437.

1972. Kuehl, H. Analysen von Wäsche-
stärkemitteln. (Seifensieder-Zeitung, Augs-
berg, 1918, Jahrg. 45, p. 462.)

Available in Library of the Department
of Agriculture.

A large number of results are given. The
samples contained from 4 to 95% mineral
components.

*Starches and Dextrins, continued.**Analytical Examination, continued.*

1973. Lamb, M. C., and A. HARVEY. Analysis of commercial dextrins. (Society of Dyers and Colourists, Journal, Bradford, 1918, v. 34, p. 10-11.) †VLA

Analysis includes determinations of moisture, ash, water-soluble matter and starch.

Abstract in *Jour. soc. chem. ind.*, 1918, v. 37, p. 133A.

1974. Beythien, A. Ist die Ausdehnung der Ersatzmittelüberwachung auf Wasch-, Bleich-, Scheuer- und sonstige Reinigungsmittel sowie auf Ersatzmittel für Wäsche-Stärke erforderlich? (Zeitschrift für Untersuchung der Nahrungs- und Genussmittel, Berlin, 1919, Bd. 37, p. 344-370.) VTA

Gives analyses of 25 samples of commercial laundry starch substitutes, with full discussion.

1975. Nagel, C. Die im Monat März 1919 erledigten Analysenaufträge. (Zeitschrift für Spiritusindustrie, Berlin, 1919, Jahrg. 42, p. 77-78, 135.) ††VTZA

Reports analyses for starches, dextrins and a number of amylaceous materials.

Abstract in *Chem. Zentr.*, 1919, Bd. 2, p. 676.

1976. Parow, Edmund. Über Untersuchungen von Kartoffelmehl und Kartoffelwalmehl. (Zeitschrift für Spiritusindustrie, Berlin, 1919, Jahrg. 42, p. 59.) ††VTZA

Abstract in *Chimie et industrie*, 1919, v. 2, p. 1087.

1977. Über Ersatzmittel für Wäsche-stärke. (Zeitschrift für Spiritusindustrie, Berlin, 1919, Jahrg. 42, p. 359.) ††VTZA

A list of twenty-two analyses of starch substitutes ranging from 1.2% salt added to potato starch, to a mixture of 14% glue, 71% chalk and 12% gypsum. — *Chem. abst.*

1978. Hoffmanns Stärkefabriken Aktiengesellschaft. Zu der Abhandlung: Über Ersatzmittel für Wäschstärke. (Zeitschrift für Spiritusindustrie, Berlin, 1919, Jahrg. 42, p. 379-380.) ††VTZA

A recent analysis of Beythien reported that "Hoffmanns Silberglanzstärke" was composed entirely of inorganic material in one test and of 38% in another. The firm, here, vigorously denies marketing such products.

Abstract in *Chem. Zentr.*, 1920, Bd. 2, p. 194.

1979. Matzdorff, Otto, and WALTER KÜHNE. Über die Fettbestimmung in Trockenkartoffeln. (Chemiker-Zeitung, Cöthen, 1920, Jahrg. 44, p. 103.) ††VOA

Investigate fat content of ten dehydrated potato products. Determinations before and after acid hydrolysis of the starch show,

in general, a greater amount of fat after hydrolysis.

1980. Prescher, Johannes, and REINHOLD CLAUS. Zwei eigenartige Ersatzmittel. (Zeitschrift für Untersuchung der Nahrungs- und Genussmittel, Berlin, 1920, Bd. 40, p. 208.) VTA

A rice starch substitute consisted of potato starch and inorganic materials.

Abstract in *Chem. Zentr.*, 1921, Bd. 2, p. 568.

1981. Arpin. Classification industrielle des amidons et des féculles. Leur dénomination commerciale. (Annales de chimie analytique, Paris, 1921, année 26, p. 74-84.) PKA

Proposes the following: Flour (farina) for ground cereals; starch (amidon) for the amylaceous products obtained from cereals and grains; and fécule for the amylaceous materials from roots and tubers. Gives analyses and microscopical characteristics of several substances in each classification.

1982. Luehrig, H. Baryumhaltiges Kartoffelmehl. (Pharmazeutische Zentralhalle, Dresden und Leipzig, 1921, Jahrg. 62, p. 144-145.)

Available in Library of Columbia College of Pharmacy.

Starching preparations containing BaCl₂ have caused several cases of sickness when used for cooking purposes.

1983. Parow, Edmund. Zur Aufklärung über Kartoffelmehl. (Zeitschrift für Spiritusindustrie, Berlin, 1921, Jahrg. 44, p. 69.) ††VTZA

The use of laundry starch substitutes for cooking purposes had recently resulted in several cases of sickness in Breslau. Because of the presence of Ba salts and other materials the author condemns the use of laundry starches for food purposes.

Abstract in *Chem. Zentr.*, 1921, Bd. 2, p. 1070.

1984. Stirnus. Die vom Mai bis Juli 1921 ausgeführten Analysenaufträge. (Zeitschrift für Spiritusindustrie, Berlin, 1921, N. F., Jahrg. 44, p. 297.) ††VTZA

Includes analysis of 4 potato starches.

Abstract in *Chem. Zentr.*, 1921, Bd. 4, p. 1146.

1985. Parow, Edmund. Über Wasserbestimmung in Kartoffelfabrikaten. (Zeitschrift für Spiritusindustrie, Berlin, 1922, Jahrg. 45, p. 181.) ††VTZA

Describes definite conditions for drying the starch.

Abstract in *Chem. Zentr.*, 1922, Bd. 4, p. 504.

1986. — Untersuchungen von Maissstärkesirup. (Zeitschrift für Spiritusindustrie, Berlin, 1922, Jahrg. 45, p. 229.) ††VTZA

Gives complete analyses of a number of starches and starch syrups of German and American origin. Finds potato starch

s and Dextrins, continued.

al Examination, continued.

show less discoloration on heating than do those of maize starch. This reaction is shown to be influenced by and protein content of the syrups. et in *Chem. abst.*, 1923, v. 17, p. 1730; *entr.*, 1922, Bd. 4, p. 1090.

Stirnus. Die vom April bis September 1922 erledigten Analysenaufträge. *Schrift für Spiritusindustrie*, Berlin, Jahrg. 45, p. 339.) †† **VTZA**
des analyses of a number of maize products.

Vogelenzang, E. H. Over de vochtigheid in aardappelmeel. (*Chemisch ad*, Amsterdam, 1922, jaarg. 19, p. .) † **3-VOA**

a difference in values obtained starches are dried in ordinary air or previously dried atmosphere. et in *Chem. Zentr.*, 1922, Bd. 4, p. 385.

1989. Aufrecht. Untersuchungen neuerer Arzneimittel, Desinfektionsmittel und Mittel zur Krankenpflege. (*Pharmazeutische Zeitung*, Berlin, 1924, Jahrg. 69, p. 1039.)

Available in Library of the Department of Agriculture.

States that a starch substitute, "Stärko," consists essentially of potato starch, NaCl and $MgSO_4$.

1989A. Preuss, E. Eine schnell durchführbare Methode zur Bestimmung der Feuchtigkeit in Handelsdextrinen. (*Zeitschrift für Spiritusindustrie*, Berlin, 1925, Jahrg. 48, p. 326-327.) †† **VTZA**

Moisture is determined by means of specific gravity measurements. Known concentrations of dextrin in water of specific gravity 1.018 to 1.0799 were prepared and tables were derived. The tables may also be used in connection with polarimetric readings. — *Chem. abst.*

(To be continued)

INTERESTING RECENT ADDITIONS

ART

Allen, Edward B. Early American wall paintings, 1710-1850. New Haven: Yale University Press; London: H. Milford, Oxford University Press, 1926. xiv, 110 p. illus. 4°. **MLP**

"The present volume is the ninth work published by the Yale University Press on the Philip Hamilton McMillan Memorial Publication Fund."

Benkard, Ernst. Giovanni Lorenzo Bernini... Frankfurt am Main: Iris-Verlag, 1926. 45 p., 80 pl. on 40 l. 8°. (Meister der Plastik. [Bd. 3.]) **MGO (Bernini)**

Boehn, Max von. Miniatures and silhouettes; translated by E. K. Walker... London: J. M. Dent & Sons, Ltd., 1926. viii, 214 p. illus. 8°. **MBO**

Bumpus, Thomas Francis. The cathedrals and churches of Italy. London: T. W. Laurie, Ltd., 1926. viii, 399 p. illus. 4°. **MRBD**

Carrick, Alice Van Leer. Collector's luck in England. Boston: Little, Brown, and Company, 1926. xx, 229 p. illus. 8°. **MAVC**

Diez, Ernst. Die Kunst Indiens... Wildpark-Potsdam: Akad. Verlagsgesellschaft m.b.H. [1926?] 193 p. illus. 4°. (Handbuch der Kunstwissenschaft.) † **MQWS**

Feuillet, Maurice. Les dessins d'Honoré Fragonard et de Hubert Robert, des Bibliothèque et Musée de Besançon... avec préface de Maurice Feuillet. Paris: L. Delteil, 1926. 6 p., 82 mounted pl., 1 mounted port. f°. (Les plus beaux dessins des musées de France. [v.] 1.) †† **MBH**
no. 187 of 600 copies printed.

Foster, William Dewey. Cottages, manoirs and other minor buildings of Normandy and Brittany; with sketches by Louis C. Rosenberg. New York City: The Architectural Book Publishing Company, P. Wenzel & M. Krakow, 1926. xviii p., 84 pl. f°. † **MRGF**

Francis, Grant R. Old English drinking glasses; their chronology and sequence... with illustrations of three hundred and eighty-five drinking glasses... and eight special plates. London: H. Jenkins, Ltd., 1926. xxxiii, 222 p. illus. f°. † **MPW**

Gualino, Riccardo. La collezione Gualino. v. 1. Torino: Bestetti e Tuminelli, 1926. illus. f°. †† **MAX**

At head of title: Lionello Venturi.
no. 250 of 350 copies printed.

Houvet, Et. Cathédrale de Chartres. [Chelles: A. Fauchaux, 1926.] 7 v. illus. f°. † **MRBN**

Kronquist, Emil Fritjoff. Metalcraft and jewelry. Peoria, Ill.: The Manual Arts Press [cop. 1926]. 191 p. illus. 8°. **MNR**

Laurie, Arthur Pillans. The painter's methods & materials; the handling of pigments in oil, tempera, water-colour, & in mural painting, the preparation of grounds & canvas, & the prevention of discolouration... all described in a practical & non-technical manner. Philadelphia: J. B. Lippincott Co., 1926. 249 p. illus. 12°. (The new art library.) **MBN**

Law, Ernest Philip Alphonse. Hampton Court gardens: old and new; a survey, historical, descriptive and horticultural, including the lay-out; the full schemes of all the bedding in the herbaceous and mixed borders and the flower beds; showing the position of every flower and shrub in the gardens. London: G. Bell & Sons, Ltd., 1926. 80 p. illus. 8°. **MSK**

Le Couteur, John Dolbel. English medieval painted glass. London: Society for Promoting Christian Knowledge [1926]. xvi, 184 p. illus. 8°. (Historic monuments of England.) **MRY**

McClelland, Nancy Vincent. The practical book of decorative wall-treatments... with 8 illustrations in colour and 206 in double-tone. Philadelphia and London: J. B. Lippincott Company, 1926. 273 p. illus. 8°. **MLO**

Mead, Marcia, and D. P. HIGGINS. Homes of character, by Marcia Mead... in collaboration with Daniel P. Higgins; with original sketches by Otto R. Eggers and photographs. New York: Dodd, Mead & Company, 1926. xix p., 1 l., 235 p. illus. 8°. **MRGK**

Meier-Graefe, Julius. Vincent van Gogh: a biographical study; translated by John Holroyd Reece, with one hundred and two illustrations after the works of the artist... London: Medici Society [1926]. 2 v. illus. 4°. **MCH (Gogh)**

Mumford, Lewis. Architecture. Chicago: American Library Association, 1926. 34 p., 1 l. 12°. (Reading with a purpose. no. 23.) **MQB**

Olmer, Pierre. Le mobilier français d'aujourd'hui (1910-1925)... Paris: G. van Oest, 1926. 60 p., 32 pl. 8°. (Architecture et arts décoratifs.) **MOF**

Parker, De Witt Henry. The analysis of art... New York: Yale University Press; London: H. Milford, Oxford University Press, 1926. xii, 190 p. 8°. **MA**

continued.

Key, Charles Mason. The national of the United States of America to it in the city of Washington. Suggested by Charles Mason Remey. (Washington, D. C., 1926. 15 p.l., 2-21 numb. 1., 6 numb. 1., 3 l. illus. 4°. **MRBB**

Barye, Charles. Louis Barye; translated by Alfred Jackson. New York: Dodd, Mead and Co., 1926. 62 p., 40 pl. sq. 12°. (Masters of modern art.) **MGO (Barye)** Made in France.

Rensselaer, Stephen. Early American bottles and flasks. Revised edition. New York: Transcript Printing Co., 1926. 2 p.l., vii-xii, 244, 320 p. 8°. **MPW**

Herbert, Newton. From Giotto to John; development of painting. London: George Allen & Co., Ltd. [1926.] xviii, 200 p. 12°. **MC**

Stalling, Karl. Chinesische Kleinbilderei. Oldenburg: G. Stalling, 1926. 1 p. illus. 4°. **† MAG**

INDUSTRIES AND INDUSTRIAL ARTS

Letts, Eleanor Hamilton, and KATH-INK. The principles of chemistry and application. A text-book for nurses. New York: The Macmillan Company, 1927. 1 p. 8°. \$3.00. **PKO (117)**

order to carry on her work intelligently, it is necessary for the nurse to have a knowledge of the underlying the various hospital procedures. The study of elementary chemistry makes the more understandable, and therefore more interesting, it seems wise to give this course early in the preliminary period as a foundation for other sciences. This helps the student of physiology and medicine to understand the processes of digestion, action of drugs as medicines, antidotes and poisons, and the reasons for certain diets in various disturbances, while a new meaning will be given to the various procedures included in hospital housework such as cleaning, laundering and the removal of stains. — Preface.

Cell, Clement V. Readable relativity, for non-specialists. London: G. Bell and Sons, Ltd., 1926. vii, 146 p. diagrs. 12°. **PAT (117)**

Book is readable only to those whose familiarity with algebra approaching matriculation standard is adequate, for it abounds in simple mathematical problems. However, for such inquirers it is certainly readable, and is one of the best expositions of relativity that we have seen." — *Nature*, supplement, April 1, 1927.

Alfred Douglas, and others, compiled. Waterworks handbook of design, construction and operation. New York: McGraw-Hill Book Company, 1927. xiv, 383, ed. illus. 8°. \$7.00. **VDL (121)** Edition of this standard work was published. Now broadened to cover the applications of engineering to irrigation, power, railways, and so on. Much new material has been added and numerous bibliographies to facilitate further study.

Goldingham, Arthur H. Diesel engines, marine and stationary, described and illustrated with numerous formulae for their design, and instructions for installation and operation. London: E. and F. Spon, Ltd.; New York: Spon and Chamberlain, 1927. viii, 255 p. illus. 3. ed. rev. and enl. 8°. 21s. **VFM (121)**

"The new edition of this well-known book has been largely rewritten and will be found of value to any engineer engaged on the purchase, design or operation of Diesel engines. Its utility to the student of the subject is increased by the excellent sectional and photographic illustrations of the latest types of two- and four-cycle, single- and double-acting Diesel engines, showing not only general arrangements but also many important details of design... Can be recommended as a clear and comprehensive work." — *Engineering journal*, April, 1927.

Hayes, Stephen Q. Switching equipment for power control. New York: McGraw-Hill Book Company, Inc., 1927. xi, 556 p. 2. ed. illus. 8°. \$5.00. **VGM (121)**

Exceeds the first edition (1921) by nearly one hundred pages. New material on steel-clad switch gear, automatic control, the tying together of neighboring stations, with the elimination of certain historical data. European ideas that seem liable to adoption in this country have been included. Author is General Engineer of the Westinghouse Electric and Manufacturing Company.

Hovey, Otis Ellis. Movable bridges. v. 2. New York: John Wiley and Sons, Inc., 1927. xvi, 344 p. illus. 8°. \$6.00. **VEK (121)**

Volume 1, covering the superstructure, was published in 1926. (See *New technical books*, 1926, v. 11, no. 3, p. 38.) Volume 2 deals in detail with power and machinery.

"Mr. Hovey has done a distinct service to the bridge engineer in assembling in this volume such information as is needed in the design of the operating mechanism of a movable bridge and has placed it before the user in a simple and readily applied form." — *Canadian engineer*, May 10, 1927.

*Loeb, Leonard B. Kinetic theory of gases, being a text and reference book whose purpose is to combine the classical deductions with recent experimental advances in a convenient form for student and investigator. New York: McGraw-Hill Book Company, Inc., 1927. xvi, 555 p. diagrs. 8°. \$5.50. **PCK (117)**

Develops three types of conceptions: (1) elementary, using little or no calculus; (2) more advanced classical derivations; and (3) some of the most recent developments available. It also contains a comparison of the theoretical deductions with modern experiment and a critique of the theories; as well as a chapter giving a summary and discussion of the kinetic theory of low-pressure phenomena. There are also applications of kinetic theory methods to the subjects of dielectric and magnetic phenomena in gases and of gaseous ionization. Author is Associate Professor of Physics in the University of California.

*Michaelis, Leonor. Hydrogen ion concentration, its significance in the biological sciences and methods for its determination. Volume 1, principles of the theory, authorized translation from the second revised and enlarged edition, by William A. Perlzweig. Baltimore: The Williams and Wilkins Company, 1926. xiv, 299 p. 8°. \$5.00. **PPR (119)**

"The present volume places the principles upon a wider basis than in the first edition... An excellent

Industries and Industrial Arts, continued.

presentation of the whole question... The translation has been very carefully done and the book puts into the hands of the English-speaking chemist a useful and comprehensive summary of the principles of a very important field of physical chemistry."—*Henry Leffman in Journal of the Franklin Institute, Dec., 1926.*

Also reviewed in *Journal of the Society of Chemical Industry*, May 6, 1927.

* **Offermann, E.** Riesenflugzeuge, unter Mitwirkung von W. G. Noack und A. R. Weyl. Berlin: Richard Carl Schmidt & Co., 1927. xi, 518 p. illus. 4°. (*Handbuch der Flugzeuge. Bd. 4.*) **VDYB (121)**

Detailed and richly diagrammed account of the development and present state of German practice in the building of giant airplanes.

* **Ostwald, Wilhelm.** Der Farbkörper und seine Anwendung zur Herstellung farbiger Harmonien. Leipzig: Verlag Unesma, G.m.b.H., 1926. 23 p., with atlas of 12 colored plates. 8° and obl. 8°. 60 mks. † **PEX**

Elaborate color atlas for the matching of individual colors and for their harmonization with other colors.

The **Oxwelder's** manual. Instruction for welding and cutting by the oxy-acetylene process. Long Island City: Oxweld Acetylene Company [1926]. 216 p. illus. 9. ed., rewritten. 8°. \$1.00. **VID (117)**

Copiously illustrated work giving the history of oxy-acetylene welding, the production of the gases, various equipments, and detailed directions for welding steel, iron, brass, bronze, monel metal, aluminum, and copper, with chapters on stelling, cutting, precautions and safe practices, and shop layout and organization.

* **Ruthven, J. F.** Popular handbook on tides for navigators and others. London: J. D. Potter, 1926. xv, 76 p. diagrs. 8°. 5s. **PSS (117)**

"Based on the theory, first put forward by Moxley, that the true astronomical tides are due solely to differential pressure, caused by the attraction of the tidal luminaries and the centrifugal force which balances it."—*Preface.*

Reviewed in *Nautical magazine*, Feb., 1927.

Tyrrell, G. W. The principles of petrology, an introduction to the science of rocks. London: Methuen and Company, 1926. xii, 349 p. illus. 12°. 10s. **PWR (117)**

"In all the author has produced an attractive and eminently readable book, expounding the fundamental principles, summarizing the recent advances, and providing in its many references to the literature of the subject the routes to less-explored regions, a book, in fact, which, with these few notes of warning, can be heartily recommended to every serious student of the science."—*C. E. Tilley in Geological magazine, March, 1927.*

"The illustrations are clear and effective, and as they are inexpensively reproduced line drawings, it has been possible to issue the book at a very reasonable price."—*Arthur Holmes in the Mining magazine, March, 1927.*

Wilson, J. Douglas, and S. O. WERNER. Simplified roof framing. New York: McGraw-Hill Book Company, 1927. vii, 122 p. illus. 12°. \$1.40. **VEK (121)**

Clearly illustrated elementary work demanding no knowledge of mechanical drawing, geometry, or trigonometry.

ASIA AND AFRICA

Abbott, Justin E. The poet-saints of Maharashtra; translations from original sources by Justin E. Abbott. no. 1. [Poona: Scottish Mission Industries Co., Ltd., 1926.] 12°. ***OKYA**

Contents: no. 1. Mahipati. Bhanudas.

Ahmad-ul-Umri. The lady of the lotus; Rup Mati, queen of Māndū, a strange tale of faithfulness, by Ahmad-ul-Umri, Turkoman, translated, with introduction & notes, together with twenty-six poems attributed to Queen Rup Mati, done into verse by L. M. Crump... London: H. Milford, 1926. viii, 96 p. illus. 8°. ***OMP**

Andrews, Roy Chapman. On the trail of ancient man; a narrative of the field work of the Central Asiatic expeditions... New York: G. P. Putnam's Sons, 1926. xxiv, 375 p. illus. 8°. **PQH**

Armstrong, Robert Cornell. Buddhism and Buddhists in Japan... New York: Macmillan Co., 1927. vii, 144 p. 12°. (World's living religions.) ***OLWL**

Butterworth, Alan. The substance of Indian faith. Camberley [Eng.]: A. Butterworth, 1926. ix, 151 p. 12°. ***OLT**

Carmichael, Amy Wilson. Raj, brigand chief; the true story of an Indian Robin Hood driven by persecution to dacoity; an account of his life of daring, feats of strength, escapes & tortures, his robbery of the rich & generosity to the poor, his sincere conversion to Christianity & his tragic end... with forewords by the Bishop of Madras, the Bishop of Tinnevely, the Bishop of Travancore & Cochin, and T. H. Somervell... London: Seeley, Service & Co., Ltd., 1927. 312 p. illus. 12°. **AN (Raj)**

David-Neel, Alexandra. My journey to Lhasa, the personal story of the only white woman who succeeded in entering the forbidden city. New York: Harper & Bros., 1927. xviii, 310 p. illus. 8°. **BDS**

De Korne, John C. Chinese altars to the unknown God; an account of the religions of China and the reactions to them of Christian missions. Grand Rapids, Mich.: Smitter Book Co. [cop. 1926.] xiii, 139 p. illus. 8°. ***OVR**

Dutt, Rajani Palme. Modern India. Bombay: Sunshine Pub. House, 1926. ii, 211 p. 16°. (Sunshine publications. no. 14.) **BGN**

Dutt, Sukumar. Problem of Indian nationality. Calcutta: University of Calcutta, 1926. xi, 199 p. 8°. **BGP**

At head of title: University Jubilee research prize-thesis, 1922.

Ellenborough (1st earl), Edward Law. India under Lord Ellenborough, March, 1842 – June, 1844; a selection from the hith-

and Africa, continued.

Unpublished papers and secret despatches of Edward, Earl of Ellenborough, with an introduction and appendices, by Algernon Law... London: J. Murray, 1926. 60, 211 p., 1 port. 8°. **BGL**

Line, Beatrice Caroline Strong. Vancities of northern Africa, by Mrs. E. Erskine; with 8 colour and 32 black-and-white illustrations by Major Benton. London: Hutchinson & Co., Ltd., 1924. 284 p. illus. 8°. ***OFZ**

Black, Harry Alverson. East of Siam; adventures in the five divisions of French Indochina... Illustrated with a hundred black-and-white photographs by the author and a map showing his travels in Indo-China. New York: The Century Co., 1927. xvii, 357 p. illus. 8°. **BFV**

Lincoln, Alan Henderson. Egyptian hieroglyphs; being an introduction to the study of hieroglyphs. Oxford: Clarendon Press, 1927. xxviii, 595 p. tables. illus. 4°. **†*OBOD**

Osman, H. C. Osman Digna, with an introduction by General Sir Reginald Winfield. London: Methuen & Co., Ltd., 1924. xxiv, 232 p. tables. illus. 8°. ***OFP**

Genchi. A study of Shintō, the religion of the Japanese nation. Tōkyō: Zaidan-Hōjin-Meiji-Seitoku-Kinen-Kai, 1926. ix, 255 p. illus. 8°. ***OSO**

Pringle. Arabian society at the time of Muhammad. Parts I & II. Calcutta: Spink & Co., 1926. vi, 253 p. 8°. ***OGO**

Vistara. The life of Buddha on the island of Barabudur, according to the Lalitavistara-text; edited by Dr. N. J. Krom. The Hague: M. Nijhoff, 1926. viii, 131 p. 4°. ***OLW**

Revolt in the desert... New York: George H. Doran Company, 1926. vi, 335 p. illus. 8°. ***OFK**

Hamish. What about North Africa? Travel in Morocco, Algeria, and Tunisia. New York: C. Scribner's Sons, 1926. iv, 362 p. illus. 12°. **BKE**

Clifford Henry. Chinese religion through the proverb. Shanghai: The Commercial Press, 1926. ix, 381 p. illus. 8°. ***OVR**

Ramchandra Dattatraya. A concrete survey of Upanishadic philosophy; a systematic introduction to Indian metaphysics. Poona: Oriental Book Company, 1926. 438, 3 p. 8°. (An encyclopedia of Indian philosophy. v. 2.) ***OKLB**

Puran. The book of the ten masas; with a foreword by Ernest Rhys.

London: Selwyn & Blount, Ltd., 1926. xxi, 153 p. 8°. (The golden Orient.) ***OLYD**

Soulié, Charles Georges. Théâtre et musique modernes en Chine, avec une étude technique de la musique chinoise et transcriptions pour piano, par André Gailhard. Paris: P. Geuthner, 1926. xvi, 195 p. illus. 4°. **†*OVK**

Williams, Edward Thomas. China yesterday and to-day... New York: T. Y. Crowell Co., 1927. xviii, 664 p. rev. ed. illus. 8°. **BEB**

Willoughby, Westel Woodbury. Foreign rights and interests in China... Baltimore: Johns Hopkins Press, 1927. 2 v. rev. and enl. ed. 8°. (Johns Hopkins University. Semicentennial publications.) **BEG**

Worringer, Wilhelm. Ägyptische Kunst; Probleme ihrer Wertung. München: R. Piper & Co., 1927. 110 p. illus. 4°. ***OBL**

PRINT MAKERS

Catalogues of Their Works

Catalogues of the engravings, or other works of reproductive graphic art, of individual print-makers are very necessary tools in the library of a print room. Many of them are illustrated with reproductions of all the works listed. This Library's collection of such books is being systematically increased. Recent accessions in this specialty include the following, various countries and periods being represented.

BESNARD, Albert. Les eaux-fortes de Besnard. Paris: Berger-Levrault, 1920. 112 p. illus. f°. **†MDG**

Text by André Charles Coppier.

BLAMPID, Edmund. A complete catalogue of the etchings and dry-points of Edmund Blampied, R.E., by Campbell Dodgson... London: H. & T. Smith, Ltd., 1926. x, 28 p., 77 pl. 4°. **†MDG**

Some plates printed on both sides.
no. 149 of 350 copies printed.

BLOOTELING, Abraham. Abraham Blooteling. Verzeichniss seiner Kupferstiche und Schabkunstblätter, beschrieben von J. E. Wessely... Leipzig: R. Weigel, 1867. 92 p. 8°. **MDG**

Repr.: Archiv für die zeichnenden Künste, Jahrg. 13.

BOSSE, Abraham. L'oeuvre gravé d'Abraham Bosse, par André Blum. [Paris:] A. Morancé, 1924. 93 p., 44 pl. 8°. ("Documents d'art.") **MDG**

BOUTET, Henri. Études sur quelques artistes originaux. Henri Boutet, graveur et pastelliste. Paris: Succursale de la Maison Dentu, 1894-95. 2 v. illus. 4°. **MDG**
v. 2. Catalogue raisonné.

CAMERON, David Young. The etchings of D. Y. Cameron, by Arthur M. Hind... London: H. & T. Smith, Ltd., 1924. vii, 43 p., 96 pl. 4°. **†MDG**

"A chronological list of Cameron's etchings," p. 31-42.

Print Makers, continued.

DREVET, Joannes. Les eaux-fortes et lithographies de Joannès Drevet... Lyon: Cumin et Masson, 1915. 120 p. illus. 4°. **MDG**
no. 135 of 305 copies printed.

DUNKER, Balthasar Anton. Balthasar-Antoine Dunker; ouvrage... suivi du catalogue de l'oeuvre gravé de B.-A. Dunker. Genève: A. Ciana, 1924. 139 p. illus. 4°. **MDG**
no. 89 of 500 copies printed.

FAITHORNE, William. A descriptive catalogue of the engraved works of William Faithorne, by Louis Fagan... London: B. Quaritch, 1888. 3 p.l., v-xiii, 104 p. 4°. **MDG**

"The life of Mr. William Faithorne": p. ix-xii.

GOLTZIUS, Henrik. Verzeichnis des graphischen Werks von Hendrick Goltzius 1558-1617; mit Benutzung der durch E. W. Moes hinterlassenen Notizen zusammengestellt von Otto Hirschmann. Mit einem noch nicht veröffentlichten Selbstbildnis von Goltzius. Leipzig: Klinkhardt & Biermann, 1921. x, 174 p., 1 port. 8°. **MDG**

HASSAM, Childe. Catalogue of the etchings and dry-points of Childe Hassam... with an introduction by Royal Cortissoz. New York, London: C. Scribner's Sons, 1925. xiv p., 1 l., 96 p. illus. f°. **† MDG**

HOSEMANN, Theodor. Theodor Hosemann; ein Altmeister Berliner Malerei, von Lothar Brieger; mit einem Katalog der graphischen Werke des Künstlers, von Karl Hobrecker. München: Delphin-Verlag [1920]. 179 p. illus. 8°. **MDG**

KOLLWITZ, Käthe Schmidt. Die Radierungen und Steindrucke von Käthe Kollwitz innerhalb der Jahre 1890 bis 1912; ein beschreibendes Verzeichnis von Johannes Sievers... Dresden: H. Holst, 1913. xii p., 74 l. illus. f°. **† MDG**

LEE-HANKEY, William. The etched work of W. Lee-Hankey, R.E., from 1904 to 1920, by Martin Hardie. London: L. H. Lefevre & Son [1921]. xiv, 97 p. illus. 4°. **† MDG**
no. 123 of 350 copies printed.

LUIKEN, Gasper. L'oeuvre de Jan et Casper Luiken, 1649-1612 [sic.], 1672-1708. Catalogue de livres ornés de frontispices et de planches, de suites de planches et de dessins formant l'oeuvre de Jan et Casper Luiken. Collection de feu M. Geisweit van der Netten... Vente à la Haye le 25 février 1884. La Haye: W. P. Van Stockum & fils, 1884. 36 p. 8°. **MDG**

MACLAUGHLAN, Donald Shaw. A descriptive catalogue of the etched work of Donald Shaw MacLaughlan; with an introduction by Marie Bruette. Chicago: Albert

Roullier Art Galleries, 1924. 104 p. illus. f°. **† MDG**

no. 97 of 106 copies printed.

An original print of the etching "Trees and fields," signed by Donald Shaw MacLaughlan, in pocket.

MELLAN, Claude. Catalogue des gravures de Claude Mellan, précédé de notices sur la collection de gravures de la bibliothèque. [By Gunnar Ekholm.] Uppsala: Almqvist & Wiksell, 1913. 51 p., 1 port. 4°. (Vilhelm Ekmans Universitetsfond, Uppsala. Arbeten utgifna med understöd af... Universitetsfond. no. 16, del 1.) **MDG**

Forms part 1 of his: Les gravures célèbres de la Bibliothèque de l'Université royale d'Uppsala.

MENZEL, Adolph Friedrich Erdmann von. Adolph Menzel; Verzeichnis seines graphischen Werkes, von Elfried Bock... Berlin: Amsler & Ruthardt, 1923. 571 p. illus. 4°. **† MDG**

RICHTER, Ludwig. Adrian Ludwig Richter, Maler und Radierer; Verzeichnis seines gesamten graphischen Werkes, von Joh. Friedr. Hoff. Zweite Auflage, von Grund aus neu gearbeitet, sehr vermehrt und mit neuen Abschnitten bereichert, unter Mitwirkung von Eugen Born, Karl Hobrecker, Walther Hoffmann, Otto Martin, hrsg. von Karl Budde... Freiburg i. Br.: G. Ragoczy, 1922. xiv, 488 p. illus. 8°. **MDG**

RIDINGER, Johann Elias. Katalog einer Ridinger-Sammlung. Bearbeitet von Dr. Ign. Schwarz... Wien: [W. Fischer,] 1910. 2 v. illus. f°. **† MDG**
no. 162 of a limited edition of 202 copies.

SCHMIDT-ROTLUFF, Karl. Karl Schmidt-Rottluffs graphisches Werk bis 1923, von Rosa Schapire. Berlin: Euphorion Verlag [1924]. 94 p. illus. f°. **† MDG**

SCHONGAUER, Martin. Katalog der Kupferstiche Martin Schongauers, von Max Lehrs. Wien: Gesellschaft für vervielfältigende Kunst, 1925. 408 p. illus. 4°. **† MDG**

SHANNON, Charles Hazelwood. The lithographs of Charles Shannon; with a catalogue of lithographs issued between the years 1904 and 1918, by Georges Derry. [London:] R. A. Walker, 1920. 3 p.l., 16 p., 2 l. 12°. **MDG**

"The following article and part of the catalogue first appeared in the Print collector's quarterly."

VISSCHER, Jan de. Jan de Visscher und Lambert Visscher. Verzeichnis ihrer Kupferstiche. Beschrieben von J. E. Wesseley... Leipzig: R. Weigel, 1866. 93 p. 8°. **MDG**

Repr.: Archiv für die zeichnenden Künste, Jahrg. 11.

VORSTERMAN, Lucas. Lucas Vorsterman; catalogue raisonné de son oeuvre, précédé d'une notice sur la vie et les ouvrages du maître; par Henri Hymans... Bruxelles: E. Bruylant, 1893. 1 p.l., 281 p., 1 l. illus. 4°. **MDG**

Makers, continued.

Alden, Julian. An essay towards a *raisonné* of the etchings, dry- and lithographs of Julian Alden by Agnes Zimmermann. New York, 1953 p. illus. f°. (Metropolitan Museum of Art, New York. Papers. v. 1.) †MDG

Woollett, William. A catalogue *raisonné* of engraved works of William Woollett, with a portrait by the artist. London: The Fine Art Society, 1885. xvi, 80 p., 1 port. 4°. MDG

AMERICA

Flagg, Samuel. Pinckney's treaty; or, America's advantage from European distress, 1783-1800... Baltimore: Johns Hopkins Press, 1926. 3 p.l., (i) 421 p. illus. 8°. (The Albert Shaw series on diplomatic history. 1926.)

ICM (Spain)

Thunder, Winnebago Indian. *Thunder; the autobiography of an Indian*, edited by Paul Radin. New York: D. Appleton and Company, 1925. xxv p., 1 l., 202, 1 p. 8°. HBC

Ely, Edward. The organization of the British army in the American revolution. New Haven: Yale University Press, 1926. xi, 223 p. 8°. (Yale historical miscellany, no. 19.) IG

Quayle, James. Foreign policies of the United States; their bases and development. Boston: Ginn and Co. [cop. 1926]. viii, 402 p. illus. 8°. IC

Johnston, Alberta. Spanish Alta California; decorations by Loren Barton. New York: The Macmillan Co., 1927. x p., 7 p. illus. 8°. IXG

Bird, George. By Cheyenne reserves... with photographs by Elizabeth Ansell. New Haven: Yale University Press, 1926. xvii, 305 p. illus. 8°. HBC

Robinson, Allen, and W. A. Robinson. Readings in recent American colonial history, 1876-1926. New York: Knickerbocker's Sons [cop. 1927]. xv, 511 p. IBG

Rendall, Ralph S. A history of the prepared under the direction of the Federal Commission of the territory of the United States with introductory chapters by Herbert Gregory. New York: The Macmillan Company, 1926. x p., 1 l., 375 p. BIC

Holladay, John. A history of American foreign policy... Garden City, New York: Doubleday, Page & Company, 1927. l., 725 p. 8°. IC

Logie, Alfred Ernest, compiler. From Lincoln to Coolidge; a selection of interesting and original historical accounts written by people of note who lived at the time of the events. Chicago: Lyons and Carnahan [cop. 1925]. vi, 357(1) p. illus. 12°. IL

Mackenzie, Frederick. A British fusilier in revolutionary Boston, being the diary of Lieutenant Frederick Mackenzie, adjutant of the Royal Welch Fusiliers, January 5-April 30, 1775, with a letter describing his voyage to America, edited by Allen French. Cambridge: Harvard University Press, 1926. x p., 1 l., 83 p. illus. 8°. IGE

Maurice, Sir Frederick Barton. Statesmen and soldiers of the Civil war; a study of the conduct of war... Boston: Little, Brown and Company, 1926. xi p., 2 l., (1) 4-173 p. illus. 8°. IKC

Palóu, Francisco. Historical memoirs of New California... translated into English from the manuscript in the archives of Mexico; edited by Herbert Eugene Bolton... Berkeley, California: University of California Press, 1926. 4 v. illus. 8°. IXG

Quick, Herbert, and EDWARD QUICK. Mississippi steamboatmen. A history of steamboating on the Mississippi and its tributaries... New York: Henry Holt and Company [cop. 1926]. xiv p., 3 l., 3-342 p. illus. 8°. VXHD

Saenz, Moises, and H. I. Priestley. Some Mexican problems (lectures on the Harris Foundation, 1926)... Chicago, Ill.: The University of Chicago Press [cop. 1926]. 3 p.l., vii-ix p., 1 l., 3-174 p., 1 l. 12°. HTC

Sawyer, Lorenzo. Way sketches; containing incidents of travel across the plains from St. Joseph to California in 1850, with letters describing life and conditions in the gold region... With historical notes compiled from rare sources and an introduction by Edward Eberstadt. New York: E. Eberstadt, 1926. 125(1) p. illus. 8°. IW

Shryock, Richard Harrison. Georgia and the Union in 1850. Durham, N. C.: Duke University Press [cop. 1926]. viii p., 2 l., (1) 4-406 p., 8 maps. 8°. (Duke University publications.) ITI

Strachey, John St. Loe. American soundings; being castings of the lead in the shorewaters of America, social, political, literary and philosophic. London: Hodder and Stoughton, Ltd. [1926]. 272 p. 8°. ILH

Vasconcelos, José, and MANUEL GAMIO. Aspects of Mexican civilization. Chicago: University of Chicago Press [cop. 1926]. ix, 193(1) p., 1 map. 12°. HTC

Verrill, Alpheus Hyatt. Panama of today. New York: Dodd, Mead and Company, 1927. xvii p., 1 l., 314 p. illus. 12°.

*R-HDL

CIRCULATION STATISTICS FOR THE MONTH OF MAY, 1927

BRANCHES	CIRCULATION		NEW REGISTRA- TIONS	VOLUMES ACCES- SIONED
	HOME USE (VOLUMES)	READERS OF REFERENCE BOOKS		
MANHATTAN				
Central Building:				
Central Circulation -----	53,821	----	705	766
Children's Room -----	2,800	3,016	50	103
Extension Division* -----	58,041	----	483	763
Library for the Blind -----	3,282	----	13	208
East Broadway, 33 -----	10,754	1,657	169	193
East Broadway, 192 -----	26,114	4,896	281	731
Rivington street, 61 -----	19,642	2,045	249	196
East Houston street, 388 -----	21,924	3,396	203	550
Leroy street, 66 -----	13,080	1,329	148	402
8th street, 135 Second avenue -----	13,603	769	111	183
10th street, 331 East -----	23,973	3,605	285	535
13th street, 251 West -----	11,407	1,491	136	263
23rd street, 228 East -----	10,705	983	132	308
23rd street, 209 West -----	9,727	1,544	194	401
36th street, 303 East -----	9,253	934	89	150
40th street, 457 West -----	9,814	605	92	398
50th street, 564 Lexington avenue -----	9,691	974	99	135
51st street, 742 Tenth avenue -----	13,085	1,124	134	153
58th Street, 121 East -----	12,661	1,600	201	308
58th " 121 " Music Library -----	1,981	1,559	----	8
67th street, 328 East -----	16,093	2,625	166	134
69th street, 190 Amsterdam avenue -----	13,291	1,730	183	184
77th street, 1465 Avenue A -----	17,750	830	110	269
79th street, 222 East -----	18,723	1,120	182	309
81st street, 444 Amsterdam avenue -----	15,791	1,245	246	367
96th street, 112 East -----	29,573	3,558	225	788
100th street, 206 West -----	19,641	1,112	272	426
110th street, 174 East -----	25,818	2,842	299	1,654
115th street, 203 West -----	19,065	1,526	195	199
124th street, 9 West -----	12,875	951	154	141
125th street, 224 East -----	11,186	1,155	183	503
125th street, 518 West -----	18,177	1,086	193	522
135th street, 103 West -----	12,031	3,338	162	246
145th street, 503 West -----	21,072	1,100	204	651
St. Nicholas avenue, 1000 -----	18,120	1,520	182	254
179th street, 535 West -----	26,088	2,247	281	395
THE BRONX				
140th street, 321 East -----	21,285	1,757	282	881
Morris avenue, 910 -----	17,294	1,579	182	680
160th street, 761 East -----	33,534	4,718	434	982
168th street, 78 West -----	11,893	2,837	201	96
169th street, 610 East -----	29,992	2,724	347	1,621
176th street and Washington avenue -----	36,584	3,868	485	433
Bainbridge avenue, 2556 -----	34,036	2,947	459	430
Kingsbridge avenue, 3041 -----	5,292	1,016	83	121
RICHMOND				
St. George -----	7,959	1,840	106	140
Port Richmond -----	10,993	906	99	114
Stapleton -----	7,109	350	78	106
Tottenville -----	5,003	330	19	67
Totals -----	851,626	84,384	9,786	19,463

* In addition 3,661 books were read at agencies of the Extension Division.

PRINCIPAL DONORS IN MAY, 1927

	VOLS.	PMS.		VOLS.	PMS.
Armée Royale de Serbie - - -	1		Kamal, Son Altesse le Prince		
As, B. Franklin - - - - -	3		Youssef - - - - -	1	
re, César Cueva - - - - -	1		Kasdai, Zewi - - - - -	2	
Gardner Weld - - - - -		1	Kiesel, Edgar E. - - - - -	1	
-Belgian Union - - - - -	1		Klein, Fritz Heinrich - - - -		1
iated Advertising Clubs of			Knights of Columbus. Charles		
World - - - - -	985	37	Carroll General Assembly,		
			Fourth Degree - - - - -	97	
ti, Dr. Salvatore - - - - -	1		Kuyper, Mrs. M. (16 periodicals)	207	114
slee, Fred Gilbert - - - - -		1	Lichtenstein, Alfred F. - - - -		1
ey, Rolland - - - - -	1		Liga Argentina para el Impuesto		
u. Universitaets-Bibliothek		24	Unico - - - - -	1	
h Museum (3 portfolios) - -	8		Liphshitz, J. L. - - - - -	2	
Chamber of Commerce			Little, Philip (15 prints) - - -		
Industry - - - - -	11		Ludwig & Ludwig - - - - -	1	
est. Chamber of Com-			McWhorter, John Camillus - - -	1	
merce and Industry - - - - -	1		Marvin, Dwight E. - - - - -	1	
ck, W. B. - - - - -	1		Marx-Engels-Institut - - - - -	26	120
u of Jewish Social Re-		24	Mather, Irwin F. - - - - -	1	
sch - - - - -	21		Mindlin, H. (2 periodicals) - - -	70	28
		32	Mirvisch, Rabbi M. H. - - - - -	1	
an, Theron L. - - - - -		1	Moore, John Trotwood - - - - -		1
ller, Robert A. - - - - -	23		Mukdoni, Dr. Alexander K. - - -	1	
a, Rev. Dr. Simon (2 manu-			Mutt, Col. Victor - - - - -	1	
pts) - - - - -			Mylan, Miss Helen - - - - -	13	2
gio de Huérfanos de la			Nussbaum, Myer - - - - -	210	
nada - - - - -	1		Oswald, John Clyde - - - - -	1	
ill, Clarence M. - - - - -	1		Preil, Rabbi E. M. P. - - - - -	1	
		46	Prudden, Miss Lillian E. - - -	1	
Samuel S. - - - - -			Richardson, Frederick (68 photo-		
William C. - - - - -	1		graphs) - - - - -		
s, Henry M. - - - - -	1		Roma, Italy. Biblioteca Nazion-		
uino, Radler (1 periodical)	1		ale Centrale - - - - -	3	5
auvilliers, Mrs. Liliane - -	38	13	Symonds, Robert H. - - - - -	1	
		7	Schmidt, Carl (2 prints) - - - -		
George Simpson - - - - -	119		Seeley, Mrs. Alfred H. - - - - -	5	
, M. C. - - - - -		1	Steiger, Augusta (20 periodicals)	85	18
, J. - - - - -		1	Stewart, Miss Mabel (15 sheets)		
John T. - - - - -	33	11	Tatsch, Jacob Hugo - - - - -	1	2
Henry - - - - -	3		Ulmann, Carl J. - - - - -	1	
r, Mrs. A. - - - - -	17	1	Universidad Mayor de San		
Tullio V. - - - - -	1		Marcos - - - - -	1	
Philip - - - - -		1	Van Benthuyssen, Alvin Seaward	1	
Pleasant Daniel - - - - -	2		Walsh, J. C. - - - - -	1	
m, John P. - - - - -	74		Webb, Mr. - - - - -	365	
Gordon (3 prints) - - - - -		21	Webster, J. Clarence - - - - -		1
berg, George J. - - - - -	20		Winters, Dr. F. William (1 peri-		
		1	odical) - - - - -	2	
gs, M. E. - - - - -			Wood, Warren - - - - -	1	
His Eminence Patrick		4	Zakharov, Feodor - - - - -		1
inal - - - - -	1				
Dr. J. H. - - - - -	1				
Rev. James L. - - - - -	5				
James W. - - - - -	1				
Mrs. Mary M. - - - - -	4				
rian Libraries Board (17					
odicals) - - - - -	11				
am, Henry Andrews - - - - -	1				
John G. - - - - -	1				

PUBLICATIONS OF THE NEW YORK PUBLIC LIBRARY

(Now in Print)

HISTORY AND GUIDES

	PRICE
History of The New York Public Library, by H. M. Lydenberg. 1923	\$2.00
Handbook of The New York Public Library	.25
Facts for the Public	.05
Central Building Guide	.05
Questions About Your Library (General Information about the Library)	Free
For Sightseers. Central Building	Free

PERIODICALS

Annual Report of The New York Public Library. (A limited number are given free upon request.)

Bulletin of The New York Public Library. Published monthly. Chiefly devoted to the Reference Department. Bibliography, news of the Library, reprints of manuscripts, descriptions of new accessions. \$1.00 a year; current single numbers for 10 cents. Back numbers at advanced rates.

Branch Library Book News. A selected list of new additions to the Circulation Department, with other lists and articles. Published monthly, except in July and August. For sale at the Branches and at the Inquiry Desk. 2 cents a copy; 25 cents a year, postpaid.

New Technical Books. A selected list of books on industrial arts and engineering, recently added to the Library. Published quarterly. 25 cents a year, postpaid.

Municipal Reference Library Notes. Published weekly except during July and August, for circulation among the officials and employees of the City of New York. Price: \$2.00 a year; 5 cents a copy. Apply at Room 512, Municipal Building.

LIST OF BOOKS IN THE LIBRARY RELATING TO VARIOUS TOPICS, TEXTS PRINTED FROM MANUSCRIPTS OWNED BY THE LIBRARY, ETC.

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Almanacs, A list of New York, 1694-1850. 1921	1.00	Avery Collection, Handbook of— Supplement: Additions of Prints, 1901-1920. 1921	.15
American Interoceanic Canals. A list of references. 1916	.30	Avesta and Romani, by Albert Thomas Sinclair. 1916	.05
American-Romani Vocabulary, by Al- bert Thomas Sinclair. 1915	.05	Beadle Collection of Dime Novels. 1922	.50
Armenia and the Armenians. A list of references. 1919	.30	Beaumarchais, Editions of, in New York City. 1925	.15
Article of Faith, An, by Hiller C. Wellman. 1919	.05	Berlin and the Prussian Court in 1798. From a ms. journal of Thomas Boylston Adams. 1916	.15
Assyria and Babylonia. A list of ref- erences. 1918	.45	Billings, Dr. John Shaw, Memorial Meeting in honor of the late. 1913	.10
Astor Library, Catalogue of the. 8 vol- umes. Sewed. Per volume	5.00	British Genealogy and Local History, List of works relating to. 1910	1.15
Automobile Tires. A list of refer- ences. 1923	.10	City Planning and Allied Topics, Se- lect list of works relating to. 1913	.15
Avery Collection, Handbook of. 1901. 84 p.	.50		

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bus. Letter of Columbus on the discovery of America. Facsimile the pictorial edition, with a new literal translation, and a complete reprint of the four oldest tin editions. 1892. Cloth	.50	Hudson, Henry, The Hudson River, Robert Fulton and Steam Navigation, List of prints, books, manuscripts, etc., relating to. 1909	.30
encement Addresses by Stephen Olin and Carl B. Roden. 1924	.10	A Hundred Years of Grand Opera in New York, 1825-1925. A record of performances. 1927	1.00
ompensations, by Asa Don Dickson. 1922	.05	The Illustrated Book. Notes on an exhibition. 1919	.15
of the U. S. Brig <i>Argus</i> in 1813. Journal of Surgeon James Inder- eck. 1917	.10	Illustrated Books of the Past Four Centuries. A record of the exhibition in 1919. 1920	.50
and Druidism. A list of references. 1920	.05	Inks, Chemistry and Manufacture of. 1926	.75
American Children's Books, 182-1840. 1927	.05	Insulating Oil. A list of references. 1927	.50
American Poetry, 1610 to 1820. List of works. 1917	.20	Inventory of the Rensselaerswyck Manuscripts. 1924	.25
Library Development in New York State. By George Watson le. 1927	.10	Irvingiana, The Seligman Collection of. 1926	.25
Device in Literature. By El- dge Colby. 1920	.25	Isle de Bourbon (Réunion) Documents, 1701-1710. Printed from the original manuscript in the Library. 1909	.20
Ancient. Sources of informa- n. 1925	2.75	Japanese-American Relations. A list of works. 1921	.40
Collection of Mss., Prints, etc., Catalogue of. Sheets. 1900	5.00	The Jewish Division in the Reference Department. 1926	Free
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ting on the Yellowstone, 1877. Fred G. Bond. 1925	.25	Journalism. A bibliography. 1924	2.00
Music of the Western Hemi- ere. 1925	.50	Joys of Librarianship, by Arthur E. Bostwick. 1918	.05
& Gardening. A selected list of books. 1927	.10	Kennan Collection. By Abraham Yarmolinsky. 1921	.10
, Mineralogy and Palæontology New Jersey, List of works on.	.15	Latin-American Periodicals Current in the Reference Department. 1920	.05
in Carniola and Carinthia, by ert Thomas Sinclair. 1917	.05	Letters of American Clergymen, 1711 to 1860. 1917	.05
of Monastir, by Rev. Lewis d. 1917	.05	Letters of American Physicians and Surgeons. 1919	.05
George and the Single Tax.	.50	The Librarian Himself, by H. L. Koopman. 1916	.05
of the Modern Printer, by garet B. Stillwell. 1916	.05	Librarian as a Unifier, by Andrew Keogh. 1915	.05
1 Printing Club, Publications e. (List and prices furnished application.)	.05	Library Tonic, by George Parker Winship. 1917	.05
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Thomas, A Bibliography of. lbridge Colby. 1922	.60	Lycanthropy. A list of works. 1920	.05
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Opera Plots, Index to. 1927	.75	Timothy Dexter and His "Pickle for the Knowing Ones." 1922	.15
Orlando Gibbons Tercentenary, by Jeffrey Mark. 1926	.15	To Nebraska in '57. A Diary of Erasmus F. Beadle. 1923	2.00
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The Pitcairn Bible. 1924	.15	Washington's Note Book. Selections from a newly discovered manuscript, edited by Victor Hugo Paltsits. 1920	.05
Prints and their Production: Supplement. 1917	.05	What Did Macaulay Say About America? Text of four letters to Henry S. Randall. 1925	.40
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Romani and Dard, by George F. Black. 1916	.05	Winthrop, Theodore, Bibliographical notes on, by Elbridge Colby. 1917	.05
Russian, other Slavonic and Baltic Periodicals, A list of. 1916	.15	Winthrop Books, Plates of the, by Elbridge Colby. 1918	.05
Schoolroom Decoration. A list of references. 1917	.05		
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Selenium. A list of references, 1817-1925. 1927	.65		

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What to Read on New York City Government. A list of references	.05

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Library Book News. *See* Periodicals.

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ue of Books for the Blind in Revised
ille. Grades One, Two and Three.
ember, 1921; Supplements, Decem-
1922, January, 1925

ue of Books for the Blind in Revised
ille. Grade One-and-a-Half. Novem-
1921; Supplements, October, 1924;
y, 1925

ue of Books for the Blind in the
on type. November, 1921; Supple-
nts, December, 1922, October, 1924.

ue of Music Scores in the Braille
e. July, 1922; Supplement, October,
5.

as Exhibit

Periodicals and Newspapers on File
he Branches

ales for Grown-up Readers

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 251 West 13th Street. (Jackson Square.)
 228 East 23rd Street. (Epiphany.)
 209 West 23rd Street. (Muhlenberg.)
 303 East 36th Street. (St. Gabriel's Park.)
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 328 East 67th Street.
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 1465 Avenue A. Near 78th St. (Webster.)
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 174 East 110th Street. (Aguilar.)
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 116th Street and Amsterdam Avenue. Room
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 224 East 125th Street.
 518 West 125th Street. (George Bruce.)

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 503 West 145th Street. (Hamilton Grange.)
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